The Dynamics Underlying Procrastination: Goal Focus as a Predictor of Activity Evaluations and its Role for Goal Pursuit

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ABSTRACT

This thesis investigates the role of goal focus (i.e., the cognitive representation of goal pursuit in terms of its means—process focus—or its ends—outcome focus) for procrastination. Specifically, it addresses the following questions: How is goal focus related to procrastination, successful goal pursuit, and subjective well-being (Parts I and II)? Does goal focus predict how people perceive activities they engage in while procrastinating (Part III)? How does goal focus change over time when people pursue versus procrastinate on intended activities (Part IV)? What questions might guide future research on procrastination in a lifespan approach (Part V)? Two longitudinal experience sampling studies yielded the following main results: (1) Process focus is adaptive for goal pursuit and negatively linked to procrastination. (2) Outcome focus is adaptive regarding some outcomes, but irrelevant or even maladaptive regarding others. (3) Goal focus is associated with how people evaluate activities they engage in while procrastinating. (4) Goal focus changes with an approaching deadline both when people pursue and procrastinate on intended activities. The overall discussion centers on the mechanisms of the (mal)adaptiveness of process and outcome focus, the processes involved during procrastination episodes, and on procrastination and goal focus across adulthood. The discussion also provides suggestions for future research and addresses implications of our findings.

ZUSAMMENFASSUNG

Diese Dissertation untersucht die Rolle des Zielfokus (Aufmerksamkeitsfokus auf die Mittel—Prozessfokus—oder Ergebnisse der Zielverfolgung—Ergebnisfokus) im Kontext der Prokrastination. Im Mittelpunkt stehen folgende Fragen: Wie hängt der Zielfokus mit Prokrastination, erfolgreicher Zielverfolgung und subjektivem Wohlbefinden zusammen (Teil I und II)? Sagt der Zielfokus vorher, wie Personen Tätigkeiten wahrnehmen, denen sie während des Prokrastinierens nachgehen? (Teil III)? Wie verändert sich der Zielfokus über die Zeit, wenn Personen intendierte Aktivitäten verfolgen vs. aufschieben (Teil IV)? Welche Fragen stellen sich bei der Erforschung der Prokrastination in einem Lebensspannenansatz (Teil V)? Die Hauptergebnisse zweier Längsschnittstudien waren: (1) Der Prozessfokus ist förderlich für die Zielverfolgung und negativ mit Prokrastination verbunden. (2) Der Ergebnisfokus ist in mancherlei Hinsicht adaptiv, in anderer jedoch irrelevant oder sogar maladaptiv. (3) Der Zielfokus beeinflusst die Bewertung von Prokrastinationstätigkeiten. (4) Mit einer näher rückenden Deadline verändert sich der Zielfokus, wenn Personen intendierte Tätigkeiten verfolgen und prokrastinieren. Schwerpunkte der Diskussion bilden die der (Mal-)Adaptivität eines Prozess- und Ergebnisfokus zugrunde liegenden Mechanismen, Prozesse während des Prokrastinierens, sowie Zielfokus und Prokrastination im Altersverlauf; ebenso werden Fragen für die zukünftige Forschung aufgeworfen und Implikationen abgeleitet.

DEDICATION

For Josua R. Schmeitzky – gone, but not forgotten

This dissertation is dedicated to the loving memory of Josua R. Schmeitzky who sadly left this life far too soon. We started this journey together, and although I am ending it without him, he is never far from my thoughts or heart. I am deeply grateful for all the joyful moments we shared.

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INTRODUCTION

Have you ever needlessly delayed an activity you had planned to do, such as working out? It is a good bet that most people would answer in the affirmative to this question. Procrastination (i.e., the voluntary delay of a goal-directed action despite intending to achieve the goal, sufficient opportunities to pursue it, and expecting to be worse off for the delay) affects virtually everyone to some degree (Steel, 2007; Wieber & Gollwitzer, 2010). When procrastination is a chronic behavior, it becomes a maladaptive lifestyle with as many as 20-25 % of the healthy adult population engaging in needless delays of relevant tasks across situations and settings (Díaz-Morales & Ferrari, 2015).

Procrastination is a troubling phenomenon both subjectively and objectively. Most people perceive it as bad, harmful, and foolish (Steel, 2007). Justifying this interpretation, a plethora of studies have shown that people often pay a steep price for procrastination in the form of lower focal task performance and reduced psychological and physical well-being (e.g., Beswick, Rothblum, & Mann, 1988; Howell, 2009; Schraw, Wadkins, & Olafson, 2007; Steel, 2007; Steel, Brothen, & Wambach, 2001; Tice & Baumeister, 1997; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009; Wolters, 2003).

Although there is widespread agreement on the centrality of self-regulation failure in understanding procrastination, the processes underlying procrastination are not yet fully understood (see Pychyl & Sirois, 2016). Prior research has predominantly focused on explaining procrastination as a dispositional variable, relating it to personality traits or trait-like constructs such as conscientiousness and fear of failure (for a meta-analysis, see Steel, 2007). In contrast, far less research has examined procrastination as a state or behavioral phenomenon that depends on situational factors (Klingsieck, Grund, Schmid, & Fries, 2013), such as specific settings

(Ferrari, 1998) or characteristics of the activities people put off (Lay, 1990; Milgram, Sroloff, & Rosenbaum, 1988; Schouwenburg, Lay, Pychyl, & Ferrari, 2004). Leading researchers in the field (Sirois & Pychyl, 2016, p. 259) have therefore stressed the need to "view procrastination as a situationally bound phenomena [*sic*]" and called for studies with a more temporal focus, such as experience sampling, to better understand the dynamic processes underlying procrastination. The present thesis answers this call by investigating goal pursuit in the natural environment of people when they pursue or procrastinate on different goals. More specifically, this dissertation expands prior research that builds on a motivational perspective on procrastination and addresses the question of how goal focus (i.e., the cognitive representation of goal pursuit in terms of the means—process focus—or the desired ends of goal pursuit—outcome focus) affects procrastination and goal pursuit (Freund & Hennecke, 2012, 2015; Freund, Hennecke, & Mustafić, in press; Freund, Hennecke, & Riediger, 2010; Hennecke & Freund, 2014; Krause & Freund, 2014a, 2014b, 2016). The central questions addressed are: How is goal focus related to procrastination, immediate correlates of successful goal pursuit, and long-term outcomes? How is goal focus related to the evaluation of activities in which people engage while pursuing their focal goals (i.e., *focal activities*) and activities in which they engage while procrastinating (i.e., *alternative activities*)? How does goal focus change with an approaching deadline in both situations (i.e., during focal goal pursuit and procrastination episodes)? How can we foster our understanding of procrastination from a lifespan perspective?

Before embarking on a more detailed description of these questions, it is necessary to introduce goal focus more fully and give a brief overview of prior research on the role of goal focus for successful goal pursuit and procrastination.

Goal Focus

The definition of procrastination outlined above includes the presence of a goal—a cognitive representation of a personally desired (or dreaded) state to be approached (or avoided) through action (e.g., Kruglanski, 1996). As such, goals direct attention, motivate and organize behavior over time and across situations, and provide a sense of direction and meaning in life (Freund, 2007b).

Goals exist in hierarchical relationships (Carver & Scheier, 1990; Kruglanski et al., 2002): Whereas primary goals (e.g., stress reduction) are ends in themselves and represent the object of striving, subgoals (e.g., signing up for a meditation workshop) are means to ends, existing only because of the primary goals. Thus, whereas subgoals are dependent on primary goals for their meaning and impetus, primary goals are dependent on the successful completion of related subgoals. Correspondingly, primary goals and subgoals also differ in their degree of specificity (abstract vs. concrete), time frame (long term vs. short term), and self-relevance (direct vs. indirect; Bandura, 1988; Houser-Marko & Sheldon, 2008).

Recent research has moved beyond these goal dimensions and, in line with the proposition that motivated behavior can best be understood from a cognitive perspective (Kruglanski et al., 2002), directed more attention to the concept of goal focus (e.g., Sansone & Thoman, 2005). The concept of goal focus taps into the definition of goals as cognitive representations, linking certain means (or actions) with desired outcomes of goal pursuit (e.g., Freund et al., in press; Kruglanski, 1996). Specifically, goal-directed behavior consists of both a cognitive representation of the higher-level outcome and the lower-level means (e.g., Carver & Scheier, 1998; Vallacher & Wegner, 1987). Activation in goal systems spreads in both directions from outcomes to means (i.e., top-down) as well as from means to outcomes (i.e., bottom-up;

Shah & Kruglanski, 2000, 2003). Accordingly, both means and outcomes may be equally salient to a person when pursuing a goal. However, this is not necessarily the case for each given goal and at each given point in time (e.g., Freund & Hennecke, 2015; Freund et al., in press, 2010). For example, when pursuing the goal to exercise regularly, people might focus more or less on the outcome of goal pursuit (e.g., focus on feeling less stressed), and focus more or less on the process of goal pursuit (e.g., focus on doing push-ups correctly). Goal focus can vary between and within people, across goals, and different phases of goal pursuit (Freund et al., in press; Krause & Freund, 2014b). Given the dynamic nature of goal representations during goal pursuit, the within-person fluctuations of outcome and process focus over time as well as between-person variance may be substantial (Freund & Hennecke, 2012; Vallacher & Wegner, 1987, 1989). Accordingly, it is essential to consider inter- and intraindividual differences when assessing goal focus (Freund et al., in press; Krause & Freund, 2014b).

Adaptiveness of Process and Outcome Focus for Goal Pursuit and Procrastination

The assumption that there is substantial inter- and intraindividual variation in the degree to which people think about the means and outcomes of goal pursuit raises the question of how goal focus is related to self-regulation and goal pursuit in general, and procrastination in particular. As for the more general question, there is growing evidence that adopting a process focus is more beneficial for successful goal pursuit, goal achievement, and subjective well-being than adopting an outcome focus (e.g., Choi & Fishbach, 2011; Freund & Hennecke, 2012; Freund et al., 2010; Hennecke & Freund, 2014; Houser-Marko & Sheldon, 2008). One explanation for this finding is that a process focus is likely to provide guidelines for goal-relevant actions, enhance planning, and reduce anxiety (e.g., Emmons, 1996; Klinger, 1977; Little, 1989; Pham & Taylor, 1999). However, there is also evidence suggesting that different

moderators may influence the adaptiveness of process and outcome focus. For instance, a process focus may be particularly beneficial when a task is difficult (Vallacher, Wegner, & Somoza, 1989) or when the goal is demanding with respect to self-regulation (Freund et al., 2010). In contrast, if a task is relatively easy to master, it might be more adaptive to focus on the outcome: By moving their attention "up" to the "why" of goals, people can better appreciate and consolidate their own reasons for striving, which may then re-energize them towards the goal (Ferguson & Sheldon, 2010; Houser-Marko & Sheldon, 2008; Vallacher & Wegner, 1989; Vallacher et al., 1989). This is in line with discrepancy theories of motivation, such as Control Theory (Carver and Scheier, 1998). These theories posit that focusing on the outcome draws attention to the discrepancy between the actual and the desired state (i.e., a comparison standard), thereby increasing the motivation to move towards the desired state. Especially when a task is perceived as aversive, being reminded of its importance may aid goal pursuit and achievement (Ferguson & Sheldon, 2010; Hennecke, Czikmantori, & Brandstätter, 2017; McCrea, Liberman, Trope, & Sherman, 2008; cf. Krause & Freund, 2016). A person who focuses on the outcome or keeps her "eyes on the prize" might also be less distracted by alternative activities (Houser-Marko & Sheldon, 2008).

Assuming that goal focus is a dynamic construct, the adaptiveness of process and outcome focus may also change across different phases of goal pursuit (Freund et al., in press; Krause & Freund, 2014b). Similarly, further evidence indicates that people can benefit from shifting from process to outcome focus when they have acquired the necessary skills to master a task (Zimmerman & Kitsantas, 1997, 1999). Taken together, these studies suggest that neither process nor outcome focus is necessarily more adaptive in and of itself, but that their adaptiveness may depend on different moderators.

Yet other perspectives stress the advantages or disadvantages of a simultaneous focus on both process and outcome of goal pursuit. On the one hand, Pham and Taylor (1999) found that a simultaneous focus tends to be more beneficial for motivation than focusing on the process alone. Probably, this simultaneous focus leads to a recognition of trade-offs between the desirability of a goal on the outcome level and its feasibility on the means level (Emmons, 1996). On the other hand, focusing on process and outcome may be overwhelming and hinder goal pursuit (Thompson, Hamilton, & Petrova, 2009).

In sum, the evidence supports the relevance of goal focus for goal pursuit. We assume that the general mechanisms underlying the adaptiveness of process focus and outcome focus discussed above also apply to procrastination. In addition, some other mechanisms are helpful for understanding why adopting a process focus may also be adaptive in the context of procrastination. People who represent a goal more concretely (vs. abstractly), which would resemble a process focus, perceive it as more urgent and, thereby, are more likely to engage in goal pursuit and to procrastinate less (McCrea et al., 2008). When people focus on small, manageable units of action, a process focus may circumvent the problem of delay of gratification as it directs attention to the small, immediate steps toward goal achievement (Steel & König, 2006). Similarly, Krause and Freund (2014b) argued that focusing on the means of goal pursuit might reduce procrastination by directing one's attention to specific actions required during goal pursuit (e.g., how to prepare for an exam) rather than to the, temporally more distant, outcomes (e.g., getting a good grade in an exam). Indeed, Krause and Freund (2016) found that process focus is negatively related to procrastination. Moreover, a stronger process focus reduced fear of failure and task aversiveness—two well-known predictors of procrastination (Steel, 2007).

The Current Work

The purpose of this thesis is to further investigate the role of process and outcome focus for procrastination and successful goal pursuit. In the remainder of this introduction, I first highlight gaps in the literature that this dissertation aims to address. Subsequently, I briefly describe the context in which we examine our research questions. Finally, I give an overview of the different parts of this dissertation.

General Aims

From a general standpoint, this dissertation aims to substantially contribute to the existing research on procrastination and goal focus by addressing the following major gaps in the literature:

First, prior research has largely focused on exploring the antecedents of procrastination and strategies to avoid it. For example, research has revealed that the characteristics of the focal activity (e.g., the aversiveness of the activity that is being procrastinated) are a central predictor of procrastination (Steel, 2007). In contrast, the underlying processes of procrastination as they unfold in situ have largely been neglected. This dissertation takes a novel approach to procrastination in that it considers characteristics of alternative activities (i.e., how people perceive the activities in which they engage while procrastinating). We argue that this perspective is crucial for a better understanding of why people procrastinate and how procrastination is sustained.

People rarely pursue goals in isolation (Elliot & Sheldon, 1997). Accordingly, this dissertation does not only consider how alternative activities are evaluated in absolute terms but also relative to the focal activity. Moreover, one central function of procrastination is to regulate one's immediate affect; seeking pleasure now, typically at a later cost (see Sirois & Pychyl,

2013; Tice & Bratslavsky, 2000). Although we generally agree that people often engage in pleasant activities while procrastinating, we assume that under given circumstances (i.e., depending on the level of process and outcome focus) alternative activities can lose their appeal. Therefore, this dissertation also addresses the question of whether people evaluate the same activities differently (e.g., in terms of pleasantness) when they procrastinate compared with when they do not.

Second, previous studies have largely been based on cross-sectional data. In contrast, this dissertation mainly takes a longitudinal perspective. Multiple measurement occasions allow for an exploration of the dynamic nature of goal focus and procrastination. In addition, intensive longitudinal methods allow for a characterization of within-person processes, which can be compared to between-person relationships between goal focus and different constructs of interest (Bolger & Laurenceau, 2013).

Third, prior research on procrastination mostly relates to academic procrastination and has been conducted with university students (Van Eerde, 2016). In contrast, only little attention has been devoted to non-academic procrastination. Therefore, this dissertation goes beyond the academic context and also addresses procrastination in the leisure context (i.e., regarding regular exercise).

Methodologically, this dissertation contributes to the literature by using a novel and innovative approach to assess self-reported thoughts, emotions, and behaviors while people engage in focal and alternative activities. The few existing experience sampling studies on procrastination (e.g., Pychyl, Lee, Thibodeau, & Blunt, 2000) have relied on randomly signaling participants throughout the day and asking them whether they were procrastinating or not. Although this sampling method has its advantages, there are also disadvantages. People are not

necessarily aware of their procrastination at each given point in time. This awareness depends on how absorbed people are in the alternative activity (i.e., "mindless procrastination," Kroese, Nauts, Kamphorst, Anderson, & de Ridder, 2016, p. 101; Sirois, 2014a) and how much they believe in their own rationalizations, such as perceiving the alternative activities as highly important (e.g., "self-indulgent reconstruals," Anderson, 2016, p. 51). In addition, random sampling may be burdensome for participants: To get a sufficient number of observations from procrastination episodes, much more signals are needed compared to when participants are signaled at times when procrastination is most likely to occur. Therefore, the studies of this dissertation take into account the interindividual variability in plans: People are sent questionnaires at times when they plan and anticipate to be most likely engaged in the focal activities. In doing so, we consider that people change their plans and, hence, we dynamically adjust the timing of the questionnaires. This is an ecologically valid way to assess procrastination. Furthermore, people do not always procrastinate. Therefore, this method also allows for testing the immediate effects of goal focus during actual pursuit of the focal goal. Hence, all in all, this dissertation takes a more dynamic and holistic perspective than prior studies.

Choice of Focal Activities

The empirical parts of this dissertation are based on two longitudinal studies involving repeated data assessment regarding the pursuit and procrastination of two different focal goals: to write a bachelor's thesis and to exercise regularly. Why did we choose these two focal goals? Both goals are usually very relevant to those pursuing them: In the academic world, a bachelor's thesis constitutes the final and necessary step for degree completion and serves as an important indicator of academic success (e.g., Krammer, Sommer, & Arendasy, 2016). Similarly, most

people are aware that regular physical activity is important for health and well-being, and therefore intend to engage in regular exercise behavior (e.g., A. S. Jackson, 2006). The fact that a large number of people pursue these goals and consider them important is relevant for at least two reasons: First, we likely take into account an essential element of the definition of procrastination, namely that the focal activity is sufficiently relevant to people. Second, it allows for a comparison between different people as they all pursue the same focal goal.

However, both goals are difficult to achieve because they require a high level of self-regulation. This explains why procrastination is highly prevalent in academia and especially so in writing tasks (Solomon & Rothblum, 1984). Similarly, a large number of people fail to stick to their exercise plans (e.g., Bocksnick, 2004; King et al., 1997). Therefore, these focal activities are ideal to obtain a sufficient amount of observations from situations in which people do not engage in these activities although they intended to do so and consider them important.

In the following sections, I provide an overview of the different theoretical and empirical parts of this thesis.

Part I: The Way is the Goal: The Role of Goal Focus for Successful Goal Pursuit and Subjective Well-Being

Part I gives a comprehensive theoretical introduction to the concepts of goals, goal pursuit/attainment, and goal focus, and reviews the empirical evidence to date. Specifically, we address the question of whether goal progress and attainment are differentially related to subjective well-being and examine how people best pursue their goals. We summarize prior research suggesting that a process focus is more beneficial for goal progress and subjective well-being than an outcome focus and discuss potential underlying mechanisms. Furthermore, we summarize first empirical evidence suggesting that adopting a process focus is adaptive with

regard to procrastination. Given that procrastination hinders successful goal pursuit and subjective well-being, this evidence highlights the importance of goal focus for understanding how people best pursue their goals. However, the relationship between goal focus and procrastination is not well understood. Accordingly, we stress the need for more research to better understand the dynamics underlying goal pursuit and procrastination. The subsequent parts of this thesis intend to provide new insights in this regard.

Part II: How to Work Out and Avoid Procrastination: The Role of Goal Focus

In Part II, we examine short-term and long-term effects of goal focus in a natural workout setting (i.e., regular exercise). Investigating the relationship between goal focus and regular exercise, Freund et al. (2010) found that process focus was positively related to different measures of successful goal pursuit and affective well-being. However, their study consisted of only two measurement occasions and the measures were not obtained while participants were exercising. Hence, in addition to finding further evidence for the overall adaptiveness of process focus (in terms of procrastination, goal achievement, workout satisfaction, and objective improvement), Part II aims at extending previous research by pointing to more immediate positive effects of process focus on workout evaluation, mood, and motivation while people are working out, as well as their intentions to stop or keep procrastinating while they are putting off working out.

Operationalizing process and outcome focus as two separate dimensions, we test the hypothesis that process focus is adaptive regarding focal goal pursuit and that process focus is a more relevant predictor than outcome focus when simultaneously estimating the effects of the two foci. Specifically, we hypothesize that a stronger process focus is linked to a lower probability that people procrastinate (vs. work out). Moreover, we hypothesize that while

working out, people with a stronger process focus perceive the workout as more important, more pleasant, and less difficult. In addition, we predict that they report a better mood, higher workout motivation, and are more confident to achieve personal workout-related goals. When people procrastinate instead of working out, we explore whether goal focus is related to what they intend to do next (i.e., keep procrastinating or start with the workout). Finally, we hypothesize that, at the end of the study, people with a stronger average process focus have fewer total procrastination episodes (see also Krause & Freund, 2016), are more likely to achieve their workout-related goals, and report a higher overall workout satisfaction. In addition to these subjective experiences, we expect people who focus more on the process to objectively improve more (i.e., show higher physical fitness gains in a fitness test).

However, although focusing on the process should be more adaptive than focusing on the outcome of goal pursuit, we hypothesize that outcome focus may also be adaptive regarding some measures of successful goal pursuit. This assumption is consistent with the finding that a combined process and outcome focus is more beneficial for motivation than process focus alone (Pham & Taylor, 1999).

Part III: A Motivational Perspective on Academic Procrastination: Goal Focus Affects How Students Perceive Activities While Procrastinating

Part III sheds light on the processes at work while people are procrastinating. Specifically, we test how goal focus is related to how people evaluate activities in which they engage while procrastinating (i.e., in absolute terms, relative to the focal activity, and relative to baseline ratings of these alternative activities), assuming that the two foci exert distinct influences on the perceptions of activities. Whereas in Part II we hypothesize that process focus is a more relevant predictor of different indicators of successful goal pursuit than outcome focus

(e.g., in terms of adaptive perceptions of the *focal* activity), in Part III we hypothesize that outcome focus is a stronger predictor of perceptions of *alternative* activities than process focus. This is because we assume that people are more likely to realize that they are procrastinating when they ask themselves *why* they are engaged in an alternative activity (i.e., when they adopt a higher outcome focus). This, in turn, should lead to substantial changes in the perception of these activities. In contrast, we assume that focusing on the activity itself (i.e., a higher process focus) should allow people to better block out that they are procrastinating and thus be more "absorbed" in the alternative activity. By virtue of lowering the awareness of one's procrastination, focusing on the process of the alternative activity should lead to fewer changes. The characteristics of alternative activities considered in Part III are importance, pleasantness, guilt, stressfulness, delay of gratification, and motivation.

Part IV: "Why Am I Doing This?" Deadlines Increase Outcome Focus for Focal and Alternative Activities

Part IV addresses the dynamics of goal focus from a different angle than Part III. Specifically, Part IV centers around the question of how goal focus changes over time (Study 1: 14 weeks; Study 2: 8 weeks), both regarding the focal activity (Study 1: working on a bachelor's thesis; Study 2: exercising) and alternative activities in which people engage while procrastinating. Research has shown that a looming deadline might intensify the salience of the positive consequences of goal-directed behavior and/or the negative consequences of missing the deadline (e.g., Locke & Latham, 2002). Therefore, we hypothesize that outcome focus increases with an approaching endpoint for the intended activity. Furthermore, our main hypothesis is that outcome focus also increases in procrastination episodes over time: When the deadline of the focal activity is looming and time becomes more precious regarding the pursuit of the focal goal,

people need to increasingly justify *why* they are engaging in alternative activities (instead of the intended activity). This focus on the why of alternative activities is reflected in a higher outcome focus. If true, this would be the first evidence suggesting that the deadline of the focal activity has consequences for the way people procrastinate (i.e., to what extent they focus on the outcome of what they are doing while procrastinating).

Moreover, the choice of two distinct focal activities allows us to test the hypothesis that the time course of process focus depends on the nature of the task. Writing a bachelor's thesis can be considered a complex array of different goal-relevant means that students have to acquire first (e.g., how to find relevant literature, how to write an abstract). In contrast, the workout is a highly repetitive set of goal-relevant activities. In two experiments, Zimmerman and Kitsantas (1997, 1999) found that people benefit from focusing on the process of an activity until a skill is developed and the behavior automatized. In line with this reasoning, we test the following hypothesis: Process focus decreases over time for the focal activity of working out (as people learn how to do the workout and automatize the behavior because of the repetitive nature of the activity). In contrast, we hypothesize that process focus remains stable at a high level over the course of writing a bachelor's thesis (because there is a low degree of automatization).

Part V: A Motivational Lifespan Perspective on Procrastination: The Development of Delaying Goal Pursuit Across Adulthood

Researchers have been prolific in exploring different possible antecedents and correlates of procrastination (see Steel, 2007). However, prior research has focused on the educational context and relied almost entirely on samples of younger adults (i.e., students). In contrast, a lifespan perspective on procrastination is lacking. Part V adopts such a lifespan perspective, focusing on procrastination across adulthood, and maintains that historically seen, people

nowadays have to take on a more important and active role in pursuing their goals due to the deregulation of the life course and increased life expectancy (Wrosch & Freund, 2001). We review and discuss first empirical evidence suggesting that older adults procrastinate less than younger adults and elaborate on potential mechanisms that might explain these age differences. Outlining a future research agenda on a lifespan approach to procrastination, we derive potential research questions that could guide future studies.

Finally, I provide an integrative discussion of Parts I to V. The integration considers the main findings of all studies and elucidates convergent, discrepant, and complementary elements. Specifically, the discussion concentrates on the mechanisms of the adaptiveness of mainly process but also outcome focus, the processes involved during procrastination episodes, as well as procrastination and goal focus across adulthood. Along the way, I provide various suggestions for future research. Finally, I discuss practical implications of our findings.

PART I: THE WAY IS THE GOAL: THE ROLE OF GOAL FOCUS FOR SUCCESSFUL GOAL PURSUIT AND SUBJECTIVE WELL-BEING

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Abstract

Goals are considered by some theories as essential for subjective well-being (i.e., telic theories, see Diener, 1984). In fact, achieving goals is beneficial for subjective well-being. However, just holding goals does not bring about goal achievement. Therefore, this chapter highlights the importance of goal *pursuit* (autotelic theories) in addition to goal achievement for a more comprehensive understanding of subjective well-being. We address the question of whether goal progress and attainment are differentially related to subjective well-being and examine how people best pursue their goals. Specifically, we posit that focusing more on the means of goal pursuit (i.e., adopting a process focus) is more beneficial for goal progress and subjective well-being than focusing more on its ends (i.e., adopting an outcome focus). There also exists some evidence that suggests that adopting a process focus is adaptive when people face a particular type of difficulty when intending to pursue a goal, namely procrastination. Given that procrastination hinders successful goal pursuit and subjective well-being, this finding again highlights the importance of goal focus for understanding how people best pursue their goals.

Part I

Introduction

Albert Einstein reportedly stated: "If you want to live a happy life, tie it to a goal, not to people or things." In fact, research shows that having a goal, even if we do not reach it, provides us with a sense of direction and meaning (e.g., Emmons, 1996; Klinger, 1977; Little, 1989). This might be best illustrated by another quote, this time from actor and martial arts master Bruce Lee: "A goal is not always meant to be reached, it often serves simply as something to aim at." Setting and pursuing long-term goals that go beyond the immediate gratification of needs such as food or shelter seems central to humans: People live by identifying desirable states they want to achieve (or undesirable ones they want to avoid) for themselves and their lives, and ways of achieving (or avoiding) these states (Carver & Scheier, 1990; Emmons, 1996; Freund, 2007a). In this chapter, we will explore some of the mechanisms by which goals affect subjective well-being.

Goals and Subjective Well-Being

A goal can be defined as the cognitive representation encompassing the linking of means to desired outcomes (Kruglanski et al., 2002). For example, the goal to get a college degree entails desired outcomes (e.g., to get a job, to impress others) and means to attain these outcomes (e.g., to study hard, to resist temptation). Because goals are comprised of means and ends, they might act as channels for new knowledge and organize information in terms of means and ends (e.g., Woike, Lavezzary, & Barsky, 2001). As knowledge structures, goals follow similar principles of activation, change, and organization that have been articulated in reference to knowledge representations in general (e.g., Higgins, 1996).

Goals have been described as building blocks for the accomplishment of a variety of developmental tasks and their achievement is likely to foster long-term patterns of successful

development (Freund & Riediger, 2006; J. Heckhausen, 1999; Ryff, 1989). As pointed out above, goals imbue life with meaning and provide structure and direction (e.g., Emmons, 1996; Klinger, 1977; Little, 1989). Against this backdrop, successful goal pursuit can be linked to both cognitive and affective aspects of subjective well-being, which represent distinct lower order constructs, but also load onto a single higher-order factor of subjective well-being (Lucas, Diener, & Suh, 1996). According to Diener, Lucas, and Oishi (2002), subjective well-being denotes "emotional reactions to events as well as cognitive judgments of satisfaction and fulfillment" (p. 63). There is no systematic investigation into a potential dissociation of affective and cognitive aspects of subjective well-being in relation to goal pursuit and goal achievement. Therefore, we will review the literature linking goals and subjective well-being as it is formulated in theories and with regard to the aspects of subjective well-being that were included in the empirical studies. Note, however, that it would be theoretically very interesting to systematically separate affective and cognitive aspects of subjective well-being and their association with goal pursuit and achievement.

Goals are often seen as essential to the cognitive aspect of well-being, as this evaluation entails the judgment of how well one is doing vis-à-vis important goals. In such telic conceptions of cognitive well-being, satisfaction indicates the degree of goal achievement, which, in turn, is crucial for experiencing life satisfaction (Diener, 1984). In other words: when people achieve goals, they experience satisfaction, when they fail to achieve goals, they experience dissatisfaction (e.g., Brunstein, 1993; Emmons, 1986; Klug & Maier, 2015). This is also in line with control theory of goals (Carver & Scheier, 1990) and goal-setting theory (Locke & Latham, 1990), according to which goals are effective because they indicate the level of performance that is acceptable.

With regard to the affective aspect of subjective well-being, prominent models such as the model of goal-directed emotions (Bagozzi, Baumgartner, & Pieters, 1998) consider anticipatory emotions, as well as emotions tied to the actual outcome of goal pursuit. Anticipatory emotions are elicited by the prospects of goal success or failure (e.g., "If I succeed in achieving my goal of getting a degree, I will feel happy"). Depending on their intensity, anticipatory emotions have a smaller or greater potential to motivate goal-directed actions that are necessary for goal attainment. Goal attainment, in turn, elicits outcome-related emotions (e.g. "Because I have now received the degree, I am happy"). Carver and Scheier (e.g., 1990) assume that the velocity with which we approach desired end states (i.e., how fast we close the gap between the actual and the desired state) is associated with positive affect (or, in the case of insufficient speed of progress, negative affect).

Thus, goals have an important function for the regulation and evaluation of behavior and subjective well-being. However, the link between goals and subjective well-being is complex. On the one hand, evidence from longitudinal studies shows that successful goal striving can boost subjective well-being (Sheldon & Houser-Marko, 2001). On the other hand, and according to the hedonic treadmill theory (Brickman & Campbell, 1971), the positive effects of reaching goals are typically short-lived (S. Frederick & Loewenstein, 1999). That is, people adapt quickly to good or bad outcomes and return to their baseline levels of happiness (e.g., Bonanno et al., 2002; Bonanno, Wortman, & Nesse, 2004; Brickman, Coates, & Janoff-Bulman, 1978; Lucas, Clark, Georgellis, & Diener, 2003; for limitations of the hedonic treadmill theory, see Diener, Lucas, & Scollon, 2006). Goals can even be understood as having an inherent potential for dissatisfaction. This is because setting goals creates a negative discrepancy between the actual and the desired state. In the same vein, McIntosh and Martin (1992) argued that people who see

goal attainment as a prerequisite for their happiness might ruminate in the case of failure, which would lead to negative mood and unhappiness.

In addition, some types of goals bring forth more subjective well-being than others. Two important goal characteristics that affect subjective well-being are *goal content* and whether goals are *approach or avoidance* goals (Carver & Baird, 1998; Kasser & Ryan, 1993). Regarding goal content: goals that satisfy basic psychological needs (e.g., to belong) and that converge with underlying motives (e.g., affiliation) are more likely to lead to emotional well-being (Brunstein, Schultheiss, & Grässman, 1998; Deci & Ryan, 2008). However, in the case of failure, they also have a stronger negative effect on subsequent subjective well-being (Sheldon et al., 2010).

Beginning with William James (1890), there is a long and rich tradition of research on approach and avoidance motivation and goals, that was reflected in learning theories (e.g., Hull, Thorndike, Skinner) as well as in motivation theories (e.g., Atkinson, Higgins, Lewin, McClelland). A review of this literature is beyond the scope of this chapter (for an entire handbook on this topic, see Elliot, 2008). Suffice it here to summarize this research very roughly by stating that approach goals are generally related to higher positive emotions and well-being, whereas avoidance goals are related to lower subjective well-being (lower positive mood, less life satisfaction, more anxiety) and performance (e.g., Coats, Janoff-Bulman, & Alpert, 1996; Elliot & Sheldon, 1997; Elliot, Sheldon, & Church, 1997; Emmons, 1996). The lifespan developmental literature has put forth a somewhat different yet related distinction between goals that are oriented towards achieving gains, maintenance, or the avoidance of loss (Freund & Ebner, 2005). This literature shows that adults become more maintenance and loss-avoidant with age, and that this shift seems adaptive when considering the age-differential association of goal-orientation and subjective well-being (for a summary, see Freund, Hennecke, & Mustafić, 2012).

Part I

Goal Pursuit and Subjective Well-Being

Despite the evidence for a positive relationship between simply holding goals and subjective well-being, having the right kind of goals is not enough to bring about goal achievement and guarantee well-being (Diener, Suh, Lucas, & Smith, 1999). Thus, important questions in the research on goals are: Are goal progress and attainment differentially related to subjective well-being? How do people best pursue their goals? We will address each of these questions in the next sections.

Differential Effects of Goal Pursuit and Attainment

The idea that goal progress and attainment may be differently related to subjective well-being has its historical roots in the question of whether subjective well-being is brought about by the attainment of desired end states (telic theories) or by the movement toward such end states (autotelic theories). The autotelic perspective has its roots in ancient Greek philosophy as for instance developed by Aristotle, who suggested that positive human experience may lie in the nature of activity itself rather than in any end state toward which such activity might be directed. This thought was seized upon by many classical theorists (for an overview, see Diener, 1984; Omodei & Wearing, 1990) and has led more recent research to explore unique effects of goal pursuit. As mentioned above, Carver and Scheier (1990) drew a direct link between goal progress and emotional well-being by viewing emotions as indicators of distance-reducing processes between actual and desired states. In line with this theory, Hsee and Abelson (1991) found that the *rate of progress* toward one's desired end states, rather than their attainment *per se*, was responsible for differences in affect. Little (2005) posited that positive psychological functioning, which includes subjective well-being, is contingent on the sustainable pursuit of core personal projects. Indeed, a recent meta-analysis (Klug & Maier, 2015) has shown that the

association between successful goal striving and subjective well-being was larger when successful goal pursuit was defined as goal progress instead of goal attainment. However, Wiese and Freund (2005) found that subjective progress in the pursuit of personal goals was not (or only weakly) related to subjective well-being (positive and negative affect, satisfaction) but that the degree to which people were involved in pursuing their goals was associated with an increase in subjective well-being over the course of three years.

There is empirical evidence for qualitatively different subjective well-being experiences between goal progress and attainment. Austin and Vancouver (1996) suggested that progressing toward a goal might be associated with a unique "flow"-like (Csikszentmihalyi, 1990) type of affect that is not related to outcome valence. Support for such distinct emotional experiences during goal pursuit and following goal attainment is provided by brain research. For example, Davidson (1994) posited that approach-related affect (e.g., enthusiasm) is usually generated when moving toward a desired goal and associated with an activation of a specific brain region (i.e., the dorsolateral prefrontal cortex). In contrast, positive affect experienced after goal attainment is phenomenologically experienced as contentment and not associated with this brain region. In sum, then, goal pursuit and progress are beneficial to subjective well-being and separate from goal attainment effects (see Wiese, 2007, for an overview). We will next elaborate more on the issue of goal pursuit.

Successful Goal Pursuit

The question how people best pursue their goals concerns the factors that promote successful goal pursuit. Different social psychological models such as the theory of reasoned action (Fishbein, 1980; Fishbein & Ajzen, 1975), the theory of planned behavior (Ajzen, 1985, 1991), and protection motivation theory (Rogers, 1975, 1983) propose that intentions to perform

a behavior are the most immediate and important predictor of actual behavior. However, although intentions (e.g., ‘‘I intend to get a degree’’) can predict actual behavior, the intention-behavior consistency is far from perfect (see Sheeran, 2002). This so called ‘intention-behavior gap’ can be the result of people not having the necessary resources, skills, or cooperation needed to turn commitment into action (Sheeran, Trafimow, & Armitage, 2003).

Often, people fail to cope effectively with problems during goal striving. That is, they may have problems detecting opportunities to act (Kruglanski et al., 2002), shielding goals from distractions (Fishbach, Friedman, & Kruglanski, 2003) or competing goals (Shah, Friedman, & Kruglanski, 2002), and monitoring progress toward goals (Liberman & Dar, 2009). Such difficulties in goal pursuit can be seen as a function of both which goal is selected (i.e., a goal’s content) as well as strategies and plans associated with how to pursue and achieve the goal (i.e., goal process). Important dimensions are the concreteness of the goal (both, concerning the means and the ends) and the difficulty of goal pursuit and attainment. Locke and Latham (2002) have summarized the core finding of more than three decades of research on goal-setting theory as showing that specific and challenging goals are best suited to promote goal success as well as subjective satisfaction. However, as Ordóñez, Schweitzer, Galinsky, and Bazerman (2009) have pointed out, setting appropriate goals in this way may be a challenge itself: People may set goals that are too specific or too challenging. Inappropriate goal setting, in turn, may have harmful effects on subjective well-being. For instance, goals can focus attention so narrowly that people neglect other important dimensions in life, or they might set goals that are so difficult that the likelihood of failure is very high.

Problems during goal pursuit might also be due to the use of inefficient means such as a poor strategy to pursue a goal or to a poor implementation of the strategy. When goals are

personally highly important, such difficulties in goal pursuit are associated with lower subjective well-being (e.g, Diener, 1984; Emmons, 1986; Little, 1983; Omodei & Wearing, 1990; Palys & Little, 1983; Ruehlman & Wolchik, 1988; Snyder et al., 1996). The obvious question, then, is: What are effective strategies of goal pursuit?

Effective strategies. Different strategies have proven effective to tackle problems during goal pursuit and to positively influence subjective well-being. One of the strategies is mental contrasting of vague positive fantasies of outcomes with the less positive actual state, thereby producing commitment to a more reachable goal and the related involvement in goal pursuit (Oettingen et al., 2009). The actual involvement in goal pursuit is related to the specification and concreteness of the representation of the behavioral steps that have to be undertaken (i.e., implementation intentions; Gollwitzer, Fujita, & Oettingen, 2004). In implementation intentions, people plan the when, where, and how of striving for a goal in the format of "*If* I encounter situation Y, *then* I will perform goal-directed response Z." A wealth of evidence supports the effectiveness of implementation intentions (e.g., Gollwitzer, 1999; Gollwitzer & Brandstätter, 1997; Parks–Stamm, Gollwitzer, & Oettingen, 2007). Combined with mental contrasting, the formation of implementation intentions is even more effective than either of the strategies alone (Adriaanse et al., 2010). Further factors that support goal progress and attainment that have been shown to increase subjective well-being include persistence, self-efficacy, and optimism (e.g., Bandura, 1997; Carver et al., 1993; Emmons, 1996; Freund & Baltes, 1998; Freund & Riediger, 2006; Scheier et al., 1989; Seligman, 1991).

Although goal progress enhances subjective well-being, being able to disengage from goals is also important for the maintenance of subjective well-being (Brandtstädter & Greve, 1994; J. Heckhausen & Schulz, 1995): When goals are beyond reach and cannot be attained,

people are at risk of compromising their subjective well-being if they do not protect emotional and motivational resources by disengaging from these goals and reengaging in new meaningful goals (Brandtstädter & Renner, 1990; J. Heckhausen, Wrosch, & Schulz, 2010; Wrosch & Miller, 2009; Wrosch, Miller, Scheier, & de Pontet, 2007; Wrosch, Scheier, Miller, Schulz, & Carver, 2003).

As pointed out above, the representation of goals in terms of concrete goal-relevant actions in a specific context (i.e., implementation intentions) as well as the specificity of outcomes (in contrast to vague fantasies) is important for successful goal pursuit and subjective well-being. However, this research does not address the consequences of focusing more on the process or the outcome of goal pursuit for successful goal pursuit and subjective well-being. We will do so in the remainder of this chapter.

Goal Focus

At the beginning of this chapter, we defined goals as cognitive representations linking means to outcomes of goal pursuit. The concept of goal focus denotes the salience of the means or the process (i.e., *process focus*) and the salience of the ends of goal pursuit (i.e., *outcome focus*) in the representation of a given goal. In other words, process focus is the degree to which a person attends to the aspects of the goal that are related to the means, whereas outcome focus is the degree to which a person attends to the desired outcomes and consequences of goal pursuit (Freund et al., 2012).

As elaborated by Freund and Hennecke (2015), relative to outcomes, means (e.g., running) are typically more proximal and concrete than their more distal and abstract outcomes (e.g., an increased endurance; Carver & Scheier, 1998; Trope & Liberman, 2003; Vallacher & Wegner, 1989). Similarly, the process of goal pursuit takes place in specific situational contexts,

whereas outcomes tend to be more decontextualized. For example, a runner must run in specific contexts (e.g., in the woods), while the desired gain in endurance is not context-bound but hopefully generalizes to diverse situations. Another feature distinguishing outcome and process focus is that outcome focus more likely provides a clear standard of comparison between actual and desired states and therefore also for goal achievement: The appropriateness of the means is measured according to the standard set by the outcome—the runner, for instance, is successful only if the running results in the desired gain in endurance; the number of miles he or she is able to run without a break reveals the discrepancy between the desired and the current state. However, different to a focus on the process, outcomes do not offer guidelines for goal-relevant actions (e.g., Emmons, 1996; Klinger, 1977; Little, 1989): Focusing on better endurance does not bring about this outcome (Oettingen, 1996), but focusing on *how* to achieve better endurance is more likely to lead to the necessary running exercises (Gollwitzer, 1999).

Similarities and Differences Between Goal Focus and Related Constructs

In order to introduce the concept of goal focus more fully, the following sections place it in the context of related psychological constructs.

Construal level and psychological distance. Construal level theory posits that the same event, object, or goal can be represented at different levels of abstractness or generality (Trope & Liberman, 2003, 2010). A low-level construal conveys specific features of a stimulus, the implications of which are often context-specific, whereas a high-level construal conveys a more global, de-contextualized representation of the stimulus (e.g., Fujita, Trope, Liberman, & Levin-Sagi, 2006). Moreover, construal level theory assumes that people use increasingly high levels of construal to represent an object as their psychological (i.e., temporal, social, spatial, or probabilistic) distance from the object increases. However, whereas construal levels denote

general mind-sets representing events or goals in more concrete/immediate or abstract/delayed terms, goal focus refers to means-ends relations (Freund & Hennecke, 2015). For example, when a dieter chooses between an apple and a candy bar as a snack, lower level construals would lead the person to focus on the immediate hedonic value and concrete features of the choice (e.g., differences in taste). Therefore, a concrete construal of the two options likely leads to a choice of the candy bar. In contrast, higher levels of construals would lead the dieter to consider the more abstract and delayed health-related implications of each food option. Therefore, an abstract construal of the two options likely leads to the choice of the apple (Fujita & Sasota, 2011). In contrast, goal focus refers to the salience of means and ends *within a given goal*. Whereas the candy bar would likely be judged a good means if the goal is to increase the hedonic enjoyment of food, it would not be considered a good means for a health goal. For a health goal, an apple would likely be represented as a better means than a candy bar (Freund & Hennecke, 2015).

Evidence for the idea that goal focus and concreteness are related but not redundant is also provided by Freund and Hennecke (2012). Although there was a weak to moderate positive association between goal focus and concreteness, goal focus explained unique variance over and above concreteness in a health-related outcome. Moreover, according to construal level theory, people construe goals along a unidimensional continuum from concrete to abstract. In contrast, process and outcome focus are conceptualized as two dimensions. Empirical evidence supports this view: We investigated how process and outcome focus change with an approaching deadline when pursuing an important goal (Kaftan & Freund, 2017), and found that they evolve asymmetrically over time. In addition, process and outcome focus show a weak positive association, implying that outcome and process focus are two dimensions rather than two opposite poles on one dimension.

Intrinsic and extrinsic motivation. When intrinsically motivated, people engage in activities because they derive satisfaction from the engagement in the activity itself, without concern for its further instrumentality. According to self-determination theory (SDT; Deci & Ryan, 2000), intrinsic motivation is content-based because an intrinsically motivated action serves at least one of three end goals that are essential for achieving and maintaining well-being: autonomy, competence, or relatedness. When extrinsically motivated, people do not act out of interest but because they perceive them as being instrumental to bring about more tangible and separable consequences like a material reward. When extrinsic goals dominate over intrinsic goals, according to SDT, they can distract people from intrinsic endeavors that support their subjective well-being (e.g., Deci & Ryan, 2008).

In contrast, goal focus is mute regarding the underlying reasons for engaging in goal pursuit as both process and outcome focus can be associated with intrinsic or extrinsic motivation (Freund et al., 2012). For example, while reading a paper, a student may focus on highlighting important passages (i.e., process focus) or focus on acquiring new knowledge (i.e., outcome focus). When focusing on highlighting important passages, the student might do so because he or she loves to structure texts with different colors (i.e., intrinsic motivation) or because he or she is positively reinforced for doing so by being paid by another student for highlighting the most important passages of the text (i.e., extrinsic motivation). Similarly, when focusing on acquiring new knowledge, the student might do so because he or she is autonomously interested in understanding new scientific discoveries (i.e., intrinsic motivation) or to impress a teacher with his or her knowledge (i.e., extrinsic motivation).

Intrinsic motivation involves enjoyment of the activity – Rheinberg (1989) describes this as the incentive that lies solely in engaging in the task – and is positively related to positive

affect (e.g., Bye, Pushkar, & Conway, 2007). Goal focus, in contrast, is affectively neutral in the sense that it takes on the affective valence that people experience or anticipate when they focus on the process or outcome, respectively. For instance, when a person focuses on highlighting important passages in a paper and experiences this activity as fun, this would likely positively influence her affect, but if she experienced this activity as boring, this would likely negatively impact her affect.

The meaning of the concept of goal focus dissolves in the structure-perspective on intrinsic motivation by Shah and Kruglanski (2000). The authors maintain that intrinsic motivation occurs when an activity (means) and the outcome of this activity (goal) are closely associated such that there is a sense of inseparability between the two (i.e., a *means-end fusion;* Kruglanski et al., 2013). A case in point is the goal to have a good time with friends where the means – doing something fun with friends – cannot be separated from the ends. If the activity itself constitutes the desirable end state, as is the case in all enjoyment goals (e.g., enjoying music, a good meal, or somebody's company), the concept of goal focus becomes vacuous as it presupposes separable means and ends.

In sum, the concept of goal focus has some overlap with other motivational constructs such as construal level as well as intrinsic and extrinsic motivation, but it also carries unique meaning that is not covered by these constructs (for links between goal focus and mastery/performance goal orientation, see Freund et al., 2012). Let us now turn to the adaptiveness of goal focus. Specifically, we first give an overview of empirical evidence suggesting that a process focus (i.e., a ''the way is the goal'' attitude) is related to a higher likelihood of achieving difficult goals and to affective well-being. Then, we will address the

underlying mechanisms that explain why focusing on the process is adaptive, and also consider situations in which an outcome focus might be more adaptive.

Adaptiveness of Process Focus for Successful Goal Pursuit and Subjective Well-Being

There is growing evidence that adopting a process focus is more beneficial to successful goal pursuit and achievement than adopting an outcome focus – particularly when goal pursuit is difficult. In a longitudinal study with overweight women, Freund and Hennecke (2012) found that focusing on the process (dietary behaviors) rather than on the outcome of dieting (weight loss) is associated with more successful goal pursuit and achievement. Similarly, Hennecke and Freund (2014) examined how goal progress during a diet (i.e., weight loss) impacts subsequent weight loss depending on whether success is identified on the process level or the outcome level of dieting. They found that successful weight loss in one week predicted less weight loss (or even weight gain) in the subsequent week – a well-known effect from the literature on "self-licensing" (e.g., De Witt Huberts, Evers, & De Ridder, 2012). However, identifying success on the process level (vs. the outcome level) attenuated this negative effect.

In the academic context, Pham and Taylor (1999) found that students who mentally simulate the process of studying for an exam study more hours and obtain higher exam scores than students who mentally simulate the feeling of receiving a good grade or that do not mentally stimulate anything at all (i.e., a control group). In the same context, focusing on the process has also been found to be adaptive when learning a new task such as acquiring writing revision skill (Zimmerman & Kitsantas, 1997, 1999). Houser-Marko and Sheldon (2008) found that students who self-reported lack of goal progress framed in terms of the outcome (which they termed "primary goal level") reported lower levels of perceived performance than students who framed lack of goal progress in terms of the process (which they termed "sub-goal level").

In other studies, a process rather than an outcome focus was positively related to dental flossing (Fishbach & Choi, 2012) and exercising adherence (Fishbach & Choi, 2012; Freund et al., 2010; Kaftan & Freund, 2018a). For example, Fishbach and Choi (2012) found that asking participants to describe why (i.e., outcome focus) they were engaging in a particular activity (e.g., yoga) resulted in a lower level of persistence than was observed when asking participants to describe their experience of the activity (i.e., process focus). Goal persistence, in turn, is associated with subjective well-being and good health (e.g., Bandura, 1986).

Similarly, in the study of Freund et al. (2010), participants with the goal to exercise regularly reported greater persistence, a higher goal satisfaction, and higher affective well-being (i.e., positive affect) over a period of 3 months when they focused on the means (vs. the outcomes) of achieving a goal. Further evidence regarding links to subjective well-being suggests that goal focus might be indirectly related to affective well-being through the ability to regulate one's behaviors and thoughts (Freund & Hennecke, 2012). Thus, outcome focus might indirectly affect negative emotions through failures of self-control. This is also supported by results from Houser-Marko and Sheldon (2008), who found that failure feedback had stronger negative effects on mood when it pertained to the outcome compared to the process. When goal pursuit is difficult, people who focus on the process are also more satisfied with their performance (Vallacher et al., 1989).

Underlying mechanisms. Why is adopting a process focus more adaptive than adopting an outcome focus? As mentioned before, a process focus likely provides guidelines for goal-relevant actions (e.g., Emmons, 1996; Klinger, 1977; Little, 1989). In their study, Pham and Taylor (1999) investigated the mechanisms by which process simulation exerts its positive effect on exam performance. They found that the effect was mediated by enhanced planning and

reduced anxiety. In a similar vein, Fishbach and Choi (2012) explained their findings by arguing that experience weighs more than the outcome as soon as people actually pursue an activity. In their study, an outcome focus not only negatively affected the positive experience of pursuing a goal but also reduced participants' motivation and adherence to goal-relevant routines. Thus, when people adopt an outcome focus, they might be more likely to pursue an activity only as a means to an end, which causes a devaluation of the intrinsic appeal of the activity. In contrast, focusing on the process may counteract the tendency for complacency and to "slack" when making progress towards goal achievement (Amir & Ariely, 2008; De Witt Huberts, Evers, & De Ridder, 2014). For example, when people focus on the process, success and failure are followed by less intense affective reactions (Houser-Marko & Sheldon, 2008). That is, focusing on the process of successful goal pursuit less likely generates a sense of achievement that can be followed by a period of decreased goal-related effort than focusing on the outcome (Amir & Ariely, 2008). In contrast, a failure in goal pursuit less strongly impairs mood, subsequent motivation, and expectancy for future goal performance when focusing on the means instead of the outcome (Freund & Hennecke, 2012; Houser-Marko & Sheldon, 2008).

There are several reasons why focusing on the process may be particularly beneficial when people learn a new task (Zimmerman & Kitsantas, 1997, 1999), a task is difficult (Vallacher et al., 1989), or the goal demanding with respect to self-regulation (Freund et al., 2010). In these cases, a process focus helps people to acquire the necessary goal-relevant means and make fewer errors. In the dieting study of Hennecke and Freund (2014), process focus (but not outcome focus) predicted increases in self-efficacy from baseline to after the diet. Self-efficacy, in turn, is known to adaptively influence the goal challenges people set for themselves, the effort they invest in the endeavor, and how perseverant they are when facing difficulties and

setbacks (Bandura, 2013). In this line, several studies have documented that people who are confident to achieve what they want (i.e., are high in self-efficacy) also experience higher subjective well-being than people who are not (i.e., are low in self-efficacy; e.g., Caprara & Steca, 2005; Lent et al., 2005; Luszczynska, Scholz, & Schwarzer, 2005). Similarly, it is likely that a higher process focus leads to higher perceived behavior control, which entails both self-efficacy (dealing largely with the ease or difficulty of performing a behavior) and controllability (the extent to which performance is up to the actor; Ajzen, 2002).

Moreover, when adopting a process focus, people more likely persist in a given activity (e.g., studying) if they experience this activity as rewarding (Freund & Hennecke, 2015). The reward might lie in the intrinsic value of the means (e.g., an increased interest in the activity) or in their instrumentality for achieving the desired outcome. When people perceive the means as particularly instrumental, this not only positively influences their motivation to pursue a given goal but also how much effort they invest in goal pursuit, and their performance (Bandura, 1997; Labroo & Kim, 2009). In turn, when people feel that they invest effort in the process of goal pursuit, they also come to view the means as more valuable and instrumental (Labroo & Kim, 2009). In contrast, an outcome focus may distract from practicing and acquiring the goal-relevant means and thereby hinder successful goal pursuit.

A related reason for the adaptiveness of process focus is that people use effort as a heuristic: the more effort they invest in goal pursuit, the more valuable they deem the outcome to be (Kruger, Wirtz, Van Boven, & Altermatt, 2004). Higher value beliefs, in turn, are linked to a higher persistence (e.g., Eccles & Wigfield, 2002; Wigfield & Eccles, 2000). Thus, when a person focuses on the means of goal pursuit, the effort he or she has invested in goal pursuit as well as the value and instrumentality of the means should be more salient compared to when the

person focuses on the outcome. A process focus should therefore intensify the described effects and contribute to greater persistence and better performance. A quote that nicely encapsulates these effort-related benefits of a process focus comes from former supreme court justice Benjamin Cardozo, who stated that: "In the end the great truth will have been learned that the quest is greater than what is sought, the effort finer that the prize (or rather, that the effort is the prize), the victory cheap and hollow were it not for the rigor of the game."

Adaptiveness of Outcome Focus

At first sight, the reviewed evidence supporting the adaptiveness of process focus for successful goal pursuit contradicts findings from other studies in the field. A first important contradiction seems to exist between the work on goal focus and research on construal level. Research on goal focus favors the adaptiveness of adopting a process focus, whereas research on construal level has shown that higher-level, more abstract construals increase the adoption of both immediate (e.g., Magen & Gross, 2007; Schmeichel & Vohs, 2009) and prospective (e.g., Fujita & Roberts, 2010) self-control strategies.

For example, Fujita et al. (2006) found that higher-level construals can improve self-control by reminding people of the reasons why (i.e., their superordinate goals) they are engaging in a difficult behavior (e.g., studying for an exam). Self-control, in turn, is related to positive affect as part of subjective well-being (e.g., Hamama, Ronen, Shachar, & Rosenbaum, 2013). However, note that goal focus denotes the salience of means and ends within a given goal, whereas the operationalization of construal level by Fujita and colleagues induces a *general cognitive mind-set* of a more high-level (i.e., abstract) and a more low-level (i.e., concrete) representation of events. This mind-set is induced using events that are unrelated to the goals and self-reported self-control judgments that are subsequently assessed. This kind of procedural

priming does not target the relative salience of the means and ends within a given goal. For instance, in Study 1, Fujita et al. (2006) asked participants to generate responses to "why" or "how" to maintain good physical health. They subsequently assessed a variant of the delay of gratification scenarios that are unrelated to physical health as a measure of self-control for various items (e.g., a DVD player), indicating a preference for immediate versus delayed rewards. In fact, Fujita and colleagues (2006, p. 355) state that "preferences for immediate versus delayed outcomes do not capture a conflict between means and ends but rather a conflict between what is primary and what is secondary."

Another potential issue that challenges the supremacy of process focus over outcome focus is that outcome focus may be adaptive in specific phases of goal pursuit. There are no studies that systematically compare the adaptiveness of outcome focus and process focus in different phases of goal pursuit, however, Freund et al. (2012; see also Krause & Freund, 2014b) suggested that process and outcome focus as well as their adaptiveness may change over the course of goal pursuit. For instance, when a deadline is still far away, a focus on the outcome may distract people from the implementation of goal-relevant actions. In contrast, once the deadline is looming, an outcome focus might revive the importance of a goal and give a final "boost" to motivation even if the means are unpleasant. If research were to show that the adaptiveness of process and outcome focus dynamically varies over time, this would also have implications for subjective well-being. One particular challenge that would have to be addressed in this research is the separation of changes in subjective well-being tied to goal focus and goal pursuit from fluctuations of subjective well-being due to independent factors such as diurnal rhythm (Chow, Ram, Boker, Fujita, & Clore, 2005; Larsen, 2000; Luhmann, Schimmack, & Eid, 2011). Solving this issue necessitates the assessment of both goal focus and indicators of

subjective well-being repeatedly over time (see Diener, Pressman, Hunter, & Delgadillo-Chase, 2017).

Similarly, Carver and Scheier (1998) argue that focusing on the outcome and comparing the current with the desired state could motivate a person to move towards the goal. Especially when a task is perceived negatively, being reminded of its importance (the abstract framing) may aid goal-pursuit and achievement (Ferguson & Sheldon, 2010; McCrea et al., 2008). Shah and Kruglanski (2003) found that priming attainment means increases the cognitive accessibility of desired goal states, which has a positive effect on persistence and performance during goal pursuit. However, the activation of goals (i.e., outcomes) by their attendant means was moderated by the perceived effectiveness of the means and it remains unclear to what extent participants consciously focused on means and outcomes during actual goal-directed striving.

If a task at hand is relatively easy to master, an outcome focus might be more adaptive than a process focus because people can better appreciate and consolidate their own motivations for striving, which may then re-energize them towards the goal (Ferguson & Sheldon, 2010; Houser-Marko & Sheldon, 2008; Vallacher & Wegner, 1989; Vallacher et al., 1989). A person who focuses on the outcome or keeps her "eyes on the prize" (Houser-Marko & Sheldon, 2008) might also be less distracted by alternative activities. In contrast, a person who focuses on task details, could feel overwhelmed (Dewitte & Lens, 2000). Further evidence suggests that people can benefit from shifting from a process to an outcome focus when they have acquired the necessary skills to master a task (Zimmerman & Kitsantas, 1997, 1999).

In summary, the existing research suggests that adopting a process focus (vs. outcome focus) promotes successful goal-pursuit and subjective well-being. More research is needed to identify boundary conditions and potential moderators and mediators of the relationship between

goal focus, successful goal pursuit, and subjective well-being. This includes the investigation of additive or synergistic effects of process and outcome focus. A simultaneous focus on both process and outcome may lead to a recognition of trade-offs between the desirability of a goal on the outcome level and its feasibility on the means level, hence be beneficial for goal pursuit. For example, in their mental simulation study, Pham and Taylor (1999) found that mentally simulating both the process and the outcome was more beneficial for motivation than mentally simulating the process alone. Conversely, focusing on process and outcome may lead to decision difficulty, that is, a greater willingness to postpone making a choice, and a lower commitment to the chosen option (Escalas & Luce, 2004; Thompson et al., 2009).

The evidence reviewed above shows that goal focus predicts successful goal pursuit and subjective well-being. Exploring the boundaries of the usefulness of this construct, the next section elaborates more on the role of goal focus in the context of one of the highly prevalent failures in goal pursuit: procrastination.

Goal Focus, Procrastination, and Subjective Well-Being

People typically do not pursue one goal in isolation but instead have multiple goals that compete for goal-relevant resources such as time and energy. For instance, wanting to pass an exam might conflict with the goal to make new friends. The presence of multiple goals thus poses challenges to goal pursuit. For example, to the extent that alternative goals are accessible, they may interfere with the commitment to a given goal. Accordingly, goals and means have to be defended or shielded by inhibiting alternative goals (e.g., Shah et al., 2002; Shah & Kruglanski, 2008). In this sense, alternative goals represent temptations. A temptation can be understood as an alternative goal, the pursuit of which hinders attainment of the focal goal, and

provides less important (though often more psychologically immediate) rewards than the focal goal (Trope & Fishbach, 2000; Trope & Liberman, 2003).

Procrastination denotes the difficulty in protecting a given focal goal against alternative goals (Dewitte & Schouwenburg, 2002; Dietz, Hofer, & Fries, 2007) and is defined as "the voluntary delay of an intended and necessary and/or personally important activity, despite expecting potential negative consequences that outweigh the positive consequences of the delay" (Klingsieck, 2013, p. 26). In other words, a person has the intention to act but delays doing so to the point of discomfort (e.g., Howell & Watson, 2007; Krause & Freund, 2014a; Solomon & Rothblum, 1984).

Procrastination and Subjective Well-Being

Over the past three decades, extensive research has provided a wealth of insights into the correlates and consequences of procrastination for subjective well-being. This research has shown that procrastination is associated with negative mood states such as depression and anxiety (Ferrari, 1991; T. R. Martin, Flett, Hewitt, Krames, & Szanto, 1996; Senécal, Koestner, & Vallerand, 1995), shame and guilt (Blunt & Pychyl, 2005; Fee & Tangney, 2000; Giguère, Sirois, & Vaswani, 2016), negative self-blame (Sirois & Kitner, 2015), negative self-evaluations in general (G. L. Flett, Stainton, Hewitt, Sherry, & Lay, 2012; McCown, Blake, & Keiser, 2012), low self-esteem (Ferrari, 1994, 2000), low levels of self-compassion (Sirois, 2014c), distress (e.g., G. L. Flett et al., 2012; Richardson, Abraham, & Bond, 2012), and poor overall mental health (Stead, Shanahan, & Neufeld, 2010). At first glance, the many ties of procrastination to subjective well-being may seem surprising because waiting to the last minute to get tasks done is often only immediately stressful and seems to save the time of longer goal pursuit. In fact, when we give talks on procrastination there is typically at least one person in the audience who proudly

claims that he or she saves time by procrastinating and gets the task done nevertheless. Obviously, the attribution we are to make is: The person is simply a genius and gets everything done perfectly well at the very last minute. However, even if this prototypical audience member is in fact a genius and an exception to the rule, the rule is that procrastination leads to lower levels of subjective well-being and task performance (Steel, 2007). In fact, it is likely that procrastination as a more enduring tendency leads to chronic stress, which is associated with an increased risk for chronic illness that can create additional vulnerabilities and compromise subjective well-being (for an overview and the *procrastination-health model*, see Sirois, 2016a, 2016b).

Linking Goal Focus to Procrastination

Procrastination research has predominantly focused on explaining procrastination as a *dispositional* trait (Milgram, Mey-Tal, & Levison, 1998) and only little research has conceptualized and investigated procrastination as a behavioral phenomenon that depends on situational or action-oriented factors (Klingsieck et al., 2013).

We assume that the general mechanisms underlying the adaptiveness of process focus discussed above also apply to procrastination. However, some additional mechanisms are helpful for understanding procrastination. People who represent a goal more concretely (vs. abstractly) perceive goals as more urgent and, thereby, are more likely to engage in goal pursuit and to procrastinate less (McCrea et al., 2008). In contrast, a higher-level, distant construal of a task (i.e., outcome focus) might lead to the conclusion that the task only needs to be completed in the distant future, thereby matching levels of construal.

Krause and Freund (2014b) argued that focusing on the means of goal pursuit might reduce procrastination by directing one's attention to the specific actions required during goal

pursuit (e.g., exam preparation) rather than to the – temporally more distant – outcome (e.g., good grade in an exam) that, in addition, might be associated with fear of failure. Testing this hypothesis, Krause and Freund (2016) found that process focus is negatively related to procrastination. In addition, a higher process focus reduced fear of failure and task aversiveness that also contributed to procrastination. In a workout study (Kaftan & Freund, 2018a), we found that people with a higher average process focus skip less workout sessions (i.e., procrastinate less), report a higher workout satisfaction, and improve more over time as measured by objective fitness indicators (i.e., number of push-ups). Additionally, average process focus was positively related to mood.

Similarly, research on implementation intentions has found that, compared to the consideration of *why* one should pursue a given goal (i.e., outcome focus), the consideration of *how* to go about pursuing a goal (i.e., process focus) leads people to faster identify opportunities to act (Parks–Stamm et al., 2007; Webb & Sheeran, 2004), to initiate goal-relevant activities (Orbell & Sheeran, 2000; Parks–Stamm et al., 2007), to anticipate action earlier (Gollwitzer, Heckhausen, & Ratajczak, 1990), and to engage in as well as complete assigned tasks prior to a deadline (i.e., to procrastinate less; Bamberg, 2002; Gollwitzer & Brandstätter, 1997).

Moreover, when people focus on small, manageable units of action, a process focus may not only provide concrete guidelines for action (Carver & Scheier, 1998; Freund et al., 2010), but also circumvent the problem of delay of gratification as it directs attention to the small, immediate steps toward goal achievement (Steel & König, 2006), and thus reduces procrastination.

Goal Focus and the Immediate Experience of Activities

Goal focus may also have very immediate effects on how people experience or perceive activities during goal pursuit. Particularly in the case of procrastination, reports of immediate experience are important because they may differ from retrospective reports due to rationalization processes. For example, students may not experience much guilt when procrastinating because they suddenly perceive cleaning as very important, only to regret afterwards that they cleaned instead of studying for an exam. In line with this reasoning, Krause and Freund (2014a) found a negative association between self-reported procrastination and affective well-being (but see Pychyl et al., 2000).

In our own experience sampling study (Kaftan & Freund, in press), we sent questionnaires to participants at times they had planned to engage in goal pursuit (writing a thesis) and asked them to indicate how they perceived the alternative activities they were currently engaged in when procrastinating. One of the results was that a higher outcome focus on alternative activities was associated with a higher perceived importance, lower pleasantness, and less guilt. These changes in the perception of activities were also found in a second experience sampling study (Kaftan & Freund, 2018a) conducted in a different context (i.e., the sports domain) and may have important consequences for further goal pursuit. On the one hand, perceiving alternative activities as more important and less guilt-evoking can be maladaptive because it may sustain procrastination. On the other hand, the lower pleasantness may serve as a stop signal to procrastination. By affecting further goal pursuit, goal focus, then, might also affect subjective well-being. Overall, these studies suggest that the relationship between goal focus and procrastination is complex and that more research is needed to better understand the dynamics underlying procrastination.

Conclusion

Whether goal attainment leads to subjective well-being depends on different factors, such as what goals are selected (e.g. approach or avoidance goals) and whether they meet basic needs (e.g., competence). Although people usually experience a form of contentment when they attain their goals, they are trapped in a hedonic treadmill running in vain for greater happiness as the effects of goal achievement are more short-lived than they might wish. Given that we typically spend much longer on pursuing our goals than experiencing their attainment, it seems crucial to investigate processes linking goal pursuit to subjective well-being. We maintain that goal focus is a promising construct for understanding the mechanisms of how goal pursuit may increase (or decrease) subjective well-being. Growing evidence supports the view that adopting a process focus (i.e., focusing on the way of goal pursuit) is associated with positive affect and subjective well-being, and leads to a higher persistence and goal attainment, even when encountering difficulties or setbacks during goal pursuit.

PART II: HOW TO WORK OUT AND AVOID PROCRASTINATION: THE ROLE OF GOAL FOCUS

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Abstract

This 8-week longitudinal experience sampling study with $N = 346$ participants ($n = 242$ completers) of a high-intensity interval training investigated how goal focus (i.e., a focus on the process vs. outcome of goal pursuit) is related to procrastination and successful goal pursuit. Specifically, the study tested the association between goal focus and participants' adherence to their workout plans (i.e., procrastination), their immediate experience during the workout (e.g., pleasantness), and their intentions to work out when they were procrastinating. Moreover, the adaptiveness of process and outcome focus was assessed regarding overall goal achievement, workout satisfaction, and objective fitness gains. The results suggest that adopting a process focus is adaptive. In addition, the analyses revealed some immediate positive effects of adopting an outcome focus. However, in contrast to process focus, outcome focus was not related to the overall outcomes and even maladaptive once people were procrastinating.

Part II

Introduction

Promoting regular exercise has been one of the highest public health priorities in recent decades (Barreto, 2013; Harrison & Liska, 1994; Warburton, Nicol, & Bredin, 2006). Nowadays, many adults are highly health conscious and exercise for physical strength, health, and well-being—be it at home, fitness centers, or outdoors. However, probably most people have experienced that they feel they lack energy to exercise, that it can be boring at times, or the weather is not right (i.e., too hot, too cold, or too rainy; Goodrick, Warren, Hartung, & Hoepfel, 1984). Thus, despite the best of intentions people often struggle to get to the local gym, put on their running shoes, or lift the dumbbells which they had bought enthusiastically only last month.

Evidence for such difficulties in exercise adherence comes from various studies. Dishman (1988) estimated that approximately 50% of individuals who begin a regular exercise program will drop out within the first six months. Indeed, exercise adherence (even with an explicit exercise prescription) does not only decrease over time (Irwin et al., 2004; K. A. Martin & Sinden, 2001) but many people have difficulties right from the onset. For example, during the first of four stages in a 16-week aerobic exercise study with 220 women (Arikawa, O'Dougherty, Kaufman, Schmitz, & Kurzer, 2012), only 63.6% of the participants adhered to the prescription.

Whether people engage in physical activity or not is a complex behavioral process influenced by social, personal, and environmental factors (Pan et al., 2009). For instance, people are more likely to exercise when they enjoy physical activity, they are highly motivated, and in a good mood. In contrast, factors such as workout difficulty (e.g., low self-efficacy) are negatively associated with physical activity (Trost, Owen, Bauman, Sallis, & Brown, 2002).

Indubitably, missing one workout session now and then is unlikely to make a significant impact on health outcomes, but it can be the start of the slippery slope to a habit of

procrastinating and missing out on exercising on a more regular basis. When procrastination is recurring, it can slow down goal progress, prevent people from achieving their goals, and negatively impact subjective well-being and health (Sirois & Pychyl, 2016; Steel, 2007).

Moreover, even when people follow their exercise schedule, they naturally will not all improve to the same extent. The degree of personal improvement will depend on a plethora of factors including training-specific behavior such as training intensity (González-Badillo, Izquierdo, & Gorostiaga, 2006) and differences in initial physical fitness (Shoenfeld, Keren, Shimoni, Birnfeld, & Sohar, 1980). Similarly, people may pursue other goals with their workout than objective improvement (e.g., improved endurance) and not be equally satisfied with their goal progress. Both their exercise satisfaction (e.g., Unger & Johnson, 1995) and the attainment of different exercise-related goals (e.g., Gyurcsik, Estabrooks, & Frahm-Templar, 2003) depend on different factors such as goal difficulty (Locke & Latham, 1990). Therefore, finding factors that not only predict procrastination versus exercise adherence but also subjective (e.g., mood) and objective (i.e., physical fitness gains) indicators of personal improvement, goal progress, and goal achievement over time, will be fruitful to develop specific interventions that might help people to stick to their plans and reach the goals they set for themselves. In this research, we examine one such potential predictor of different facets of successful goal pursuit in the fitness context, namely goal focus (i.e., the extent to which people focus on the process or the outcome of goal pursuit; Freund & Hennecke, 2015).

Procrastination

Although a large number of people have problems executing intended exercise behaviors (Bocksnick, 2004; King et al., 1997), procrastination research has largely been restricted to the domains of work and academic behavior (Lay, 1986; Schouwenburg & Lay, 1995; Steel, 2007).

However, there are good reasons to assume that procrastination is not constrained to these domains. Defined as the purposive delay of an intended course of action despite the expectation to be worse off for the delay (Steel, 2007), procrastination can creep into every aspect of everyday life whenever people plan actions (e.g., to pay a bill, book a vacation, or answer an email), as situational predictors of procrastination (e.g., tempting distractors) occur in many different contexts. Moreover, every fifth person of the general population self-identifies as a chronic procrastinator (e.g., Ferrari, O'Callaghan, & Newbegin, 2005; Harriott & Ferrari, 1996). In short, procrastination is a widespread problem that also affects health behaviors (Kroese & De Ridder, 2016; Pychyl & Sirois, 2016).

Motivational Accounts

Senécal, Koestner, and Vallerand (1995) consider procrastination to be a motivational problem. According to this perspective, people do not lack the intention to work out when procrastination is the reason for low exercise adherence. They know what to do (e.g., how to perform a push-up), plan to do it (e.g., do three sets of push-ups every evening), but they do not follow through. This intention-behavior gap has been described as the core of the procrastination phenomenon (Lay, 1986; Steel, 2007) and shown to be associated with different factors including personality traits, the proximity of temptation, impulsiveness, and task characteristics (for an overview, see Rozental & Carlbring, 2014).

Although there are comprehensive motivational accounts of procrastination (Steel & König, 2006), motivational investigations of both procrastination and physical activity often involve single constructs of motivation such as intrinsic motivation, planning, and self-efficacy (C. M. Frederick & Ryan, 1993; Steel, 2007). A common feature of these motivational accounts of procrastination and health behavior is that they usually make explicit or implicit reference to

the construct of goals—one of the central constructs in motivation research (e.g., Locke & Latham, 1990). However, whereas the literature has focused primarily on person characteristics or situational factors that foster or hinder goal pursuit and achievement, the question of which cognitive representations of goals might be related to procrastination and personal improvement has been largely neglected (cf. Blunt & Pychyl, 2005). Using the sample case of the goal to work out regularly, the current research tests the role of one characteristic of the cognitive representation of goals, goal focus, for procrastination, the experience of the workout, as well as personal improvement (i.e., fitness gains) and goal achievement during a workout routine.

The Role of Goal Focus for Health Behavior and Procrastination

Goals can be defined as subjectively desirable (or dreaded) states that a person intends to attain (or avoid) through action (Kruglanski, 1996). Like every goal, the goal to exercise regularly comprises desired outcomes (e.g., improve attractiveness or health) and means to achieve these outcomes (e.g., to follow a certain workout routine). However, people may differ (among each other or across different goals or situations) in their goal focus, i.e., how much they focus on the means of goal pursuit (i.e., *process focus*) or the consequences (i.e., *outcome focus*; Freund, Hennecke, & Mustafic, 2012; Freund, Hennecke, & Riediger, 2010; Sansone & Thoman, 2005; Vallacher & Wegner, 1987).

Previous research suggests that inter- and intraindividual differences in goal focus are related to successful goal pursuit in the domain of health behavior. In a 6-week longitudinal study with overweight women, Freund and Hennecke (2012) found that focusing on the means rather than the desired outcomes of a low-calorie diet is positively related to weight loss. The authors argued that a focus on the process might be associated with a vigilant monitoring of one's goal-related behavior, whereas focusing on the outcome might distract from good

opportunities to implement goal-relevant means (see also Oettingen, 1996). Fishbach and Choi (2012) demonstrated that while practicing yoga, thinking about outcomes renders the experience less positive and undermines goal pursuit more than focusing on the experience itself. Similarly, in a study by Freund, Hennecke, and Riediger (2010), process focus but not outcome focus was positively associated with self-reported exercise frequency, regularity, importance, and positive affect. In addition, process focus longitudinally contributed to an increase in positive goal evaluations such as goal satisfaction, involvement, or subjective closeness to the goal. Although Pham and Taylor (1999) also found evidence that supports the superiority of adopting a process focus, in this case in the academic domain, they reported that the combination of a high process and outcome focus was more beneficial for motivation than process focus alone.

There are no studies in the sports domain that investigate the relationship between goal focus and procrastination. However, referring to procrastination, Krause and Freund (2016) found that process focus is negatively linked to procrastination in the academic context. In addition, a higher process focus reduced fear of failure and task aversiveness, two factors which contributed to procrastination. In sum, the results of this study suggest that adopting a process focus might also be more beneficial than adopting an outcome focus with regard to both procrastination (here: exercise adherence) and goal achievement in the sports domain. More specifically, we are interested in the unique and, following Pham and Taylor (1999), also the potential additive effects of process and outcome focus on the experience of an activity, different goal-related outcomes, and procrastination (i.e., when controlling for the effect of the other focus).

The Present Study

We conducted an experience sampling study to investigate the effects of goal focus on procrastination regarding the goal to engage four times per week in a high intensity interval training. The study involved 32 measurement points over eight weeks between a pre-study and post-study fitness test. Overall, we hypothesized that process focus is adaptive and that process focus is a more relevant predictor than outcome focus. Specifically, we hypothesized that a higher process focus is linked to a lower probability to procrastinate. Moreover, we hypothesized that, while working out, people with a higher process focus perceive the workout as more important, more pleasant, and less difficult. In addition, we expected participants to report a better mood, higher workout motivation, and higher confidence to achieve their workout-related outcomes. When people procrastinated on working out, we explored whether goal focus is related to what they intended to do next (i.e., keep procrastinating or start with the workout). Finally, we hypothesized that, at the end of the study, people with a higher process focus have fewer total procrastination episodes, are more likely to achieve their personal workout-related goals, and report a higher overall workout satisfaction. Additionally, they should also objectively improve more (i.e., show higher physical fitness gains in a fitness test) when they focus more on the process.

Methods

Sample

The study targeted adults intending to follow a new workout routine at home. Participants were recruited via advertisements in Internet forums (e.g., University of Zurich students' forums) and the participant pool of the Department of Psychology at the University of Zurich. The

advertisements included a link to a first online questionnaire, which was created and published using an online questionnaire tool (SoSci Survey; www.soscisurvey.de).

Power calculations based on Monte Carlo simulations as implemented in the simr package (Green, MacLeod, & Alday, 2016) in R suggested that a sample size of $N = 240$ is needed to have a power of at least 80% to detect a slope of 0.05 at an alpha level of .05. By using a slope of 0.05, we took a conservative approach because this was the smallest significant slope obtained in previous multilevel analyses of the association between goal focus and activity evaluations (Kaftan & Freund, in press). We expected that when starting a new exercise regimen, there would be a substantial number of dropouts. Hence, we oversampled by 30% and aimed to recruit a sample of about $N = 340$. The original sample consisted of $N = 346$ participants (65% female) aged 18 to 65 years ($M = 32.35$, $SD = 11.21$) who attended a pre-study fitness test. As expected, there was a substantial number of dropouts, resulting in a sample of $n = 242$ (64% female, aged 18 to 63 years, $M = 33.15$, $SD = 11.57$) at the end of the eight-week period. As for highest level of education completed, 2.3% of the participants reported having completed compulsory education/lower secondary education, 45.1% upper secondary level education (vocational education, baccalaureate school, or upper secondary specialized schools), 50.3% a university degree, and 2.3% other degrees. Most participants were employed (76.4%) or students (17.8%).

Procedure

Participants first filled out a health screening questionnaire, which consisted of the somatization subscale of the SCL-90-R (Derogatis, 1977; Franke, 1995), an indication of number of repetitions in a one-minute sit-to-stand test (Bohannon, Bubela, Magasi, Wang, & Gershon, 2010), various questions on cardiovascular health (e.g., high blood pressure), and an open

question on existing health issues. We did not allow people to enter the study if they reported a sum score greater than 30 on the SCL-90-R, less than 20 repetitions in the sit-to-stand test, any cardiovascular diseases, or a condition that might pose a risk to the participants (e.g., pregnancy).

Instructions, pre-study fitness test, and baseline questionnaire. After the screening questionnaire, participants had an appointment with a fitness instructor and a student assistant in a gym in groups of up to five participants. The fitness instructor showed them the workout routine that consisted of a high-intensity interval training of four sets of eight different exercises (i.e., jumping jack, jumping sideways, lunge, push-up, swimmer, plank, sit-up, and high knees). This workout does not require any equipment and can be performed at any location. The workout alternates between 20 second periods of intense exercise with 10 second recovery periods. Four workout sets are considered one workout session and take 16 minutes. The instructor showed the participants one set, asked them to do the exercises, and corrected them if necessary. Subsequently, the objective measures were assessed. Half of the participants stayed with the instructor to take a pre-study fitness test consisting of four different exercises (i.e., hold a plank and squat position for as long as possible, perform as many high knees as possible within one minute, and perform as many push-ups as possible without a break). The other half went one by one to a separate room, where the student assistant assessed various physical measures on an electronic scale (e.g., body fat). However, because of reliability issues with the scale, we did not consider these values for the analyses. Finally, the two groups of participants switched.

Participants received a link to a video with the full workout routine, which they could access at any time. They were asked to do one workout practice session at home and subsequently received a baseline questionnaire. In this questionnaire, participants responded to basic demographic questions and filled out an adapted version of the Pure Procrastination Scale

(Steel, 2010; German version see Krause & Freund, 2014a), which measures trait procrastination. Participants also specified which workout-related goals they wanted to achieve with the workout. In addition, the questionnaire included different scales not relevant for this paper (e.g., ratings regarding different activities). Finally, participants indicated four weekly time windows of one hour in which they planned to do the exercises. They could change their time windows over the course of the study but were asked to provide us with the new time windows at least one day before the desired change to avoid short-term changes in plans characteristic for procrastination.

Questionnaires during workout windows. Starting eight weeks before the week in which the post-study fitness test took place, each participant received a questionnaire four times a week on the indicated workout day at the end of the indicated time window followed by an SMS prompt. Participants were asked to fill out the questionnaire as soon as possible and no later than 15 minutes after the prompt. In this questionnaire, participants indicated what they had been doing. When they responded that they had been working out, their goal focus was assessed with regard to this activity. When they responded that they had not been working out, they were asked what they were doing and to rate the goal focus with regard to that activity. Moreover, participants rated the current activity regarding different characteristics (e.g., importance, pleasantness, difficulty), and filled out other measures such as mood.

Post-study fitness test and final questionnaire. Participants filled out weekly questionnaires that are not relevant for the present study. At the end of the study, participants did a post-study fitness test in the gym, which was identical to the pre-test, and then completed a final questionnaire, in which they evaluated the past weeks on various dimensions (e.g., overall satisfaction with workout and achievement of personal goals).

As a way of compensation for participation, participants who filled out at least 50% of all questionnaires (n = 184) received a comprehensive individualized written feedback. In addition, they were given a voucher for free entrance to the gym, in which the instructions had taken place. Participants who filled out less than 50% of all questionnaires (n = 58) received a less detailed feedback and the voucher.

Response Rate and Data Handling

Overall, we sent out a total of 8,957 questionnaires during planned workout windows, of which 53.2% (4,766) were completed in time (i.e., within 15 minutes) with an average response time of 5.22 minutes (SD = 3.52 min), 19.1% (1,707) too late with an average response time of 370.47 minutes (SD = 628.75 min), and 27.7% (2,484) were not filled out at all. Results did not change substantially when including in the analyses questionnaires that were filled out too late. Therefore, we used all available data to increase the reliability of the results without biasing them.

Except for the overall analyses, in which only data from the completers were considered, we included all available data at each point in time, including that of the n = 104 participants who dropped out over the course of the study. We did not impute data because of the unknown reasons for why participants missed a given measurement point. Trait procrastination predicted the number of filled out questionnaires, $\beta = -.19$, $t(344) = -3.51$, $p = .001$, but only accounted for 3.5% of the variance. Similarly, dropouts (M = 36.65, SD = 11.92) reported higher trait procrastination than completers (M = 33.79, SD = 11.36), $t(344) = -2.12$, $p = .035$, but the effect size was small (d = 0.25). Neither education, χ^2 (6, N = 346) = 9.00, $p = .17$, nor initial fitness as assessed by the sit-to-stand test, Exp(B) = 0.997, Wald = 0.90, $df = 1$, $p = .77$, predicted whether the participants completed the study or not. In addition, a logistic regression analysis was

conducted to predict dropout with average process and outcome focus during the workout. A test of the full model against a constant only model was not statistically significant ($\chi^2 = 1.12$, $df = 2$, $p = .57$). None of the predictors was significant (all $p > .36$).

Measures

Goal focus. To assess goal focus during the workout window, the participants rated to what extent they were focusing on what they wanted to achieve with the workout (i.e., outcome focus) and to what extent they were focusing on the workout itself (i.e., process focus; a list of all measures used in this study is provided in Appendix A). If they did not work out, they indicated what they were doing and rated goal focus regarding the indicated activity. Goal focus was assessed on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (very much).

Activity characteristics. Participants rated the importance, pleasantness, and difficulty of the workout on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (very much). In addition, on the same scale, they rated how motivated they were to work out. Their confidence to achieve their personal workout-related goals was assessed on a scale from 0 (not at all) to 100 (very much) using a continuous slider and afterwards rescaled to have the same range as the other continuous variables (i.e., 1 to 7).

Mood. Mood was assessed with the "good-bad mood" subscale from the German version of the Multidimensional Mood State Questionnaire (MDBF; Steyer, Schwenkmezger, Notz, & Eid, 1997). This subscale consists of four items (i.e., "content," "good," "bad," "unwell"; Cronbach's $\alpha = .75$). Participants indicated how much they had felt these affects at the moment on a 7-point Likert scale from 1 (not at all) to 7 (very much). The items "bad" and "unwell" were reverse coded before the subscale was created by dividing the sum score by 4 to obtain a 1-7 subscale score as for the other variables. Higher values indicate better mood.

Intention during procrastination episodes. If participants indicated that they had not worked out during the chosen time windows, they were asked what they intended to do after completing the questionnaire. The options were: (1) "Keep doing what I was doing," (2) "work out," and (3) "something else." The first and third category were collapsed into a "no workout" category (coded with 0; the "work out" category was coded with 1).

Goal achievement and workout satisfaction. At the end of the study, participants indicated whether they had achieved their personal workout-related goals (0 = not achieved/no longer achievable, 1 = achieved). In addition, they rated their overall workout satisfaction on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (very much).

Objective measures. To obtain a score for the personal improvement in the four test exercises (i.e., plank, push-ups, squat, high knees) over the workout period, the pre-test fitness scores were subtracted from the post-test scores (i.e., positive values indicate improvement).

Statistical Analyses

To investigate the effects of goal focus while participants had been working out or procrastinating, we applied multilevel analyses. Both predictors, process and outcome focus, varied within as well as between persons. Therefore, we followed the procedure recommended by Bolger and Laurenceau (2013) to partition the variables into their constituent within-subjects (within process focus/within outcome focus) and between-subjects (between process focus/between outcome focus) components. This partition yielded a total of four variables, two (Level 2) between-persons variables and two (Level 1) person-centered variables that varied at each measurement occasion. Level 1 variables represent the scores of participants with respect to their own mean across all measurement occasions. We also considered possible interactions between the two foci at both levels of analysis (i.e., within- and between-subjects interaction)

except for the prediction of the current activity where a model with an interaction did not converge. Although we were not interested in time trends, we followed the recommendation of Bolger and Laurenceau (2013) and included the centered week number as a fixed effect in the model to control for potential effects of time. The analyses allowed a random intercept as well as random slopes for each of the two foci and (with the mentioned exception) their interaction at the within-person level.

Multilevel analyses were conducted with R (Version 3.3.1; R Development Core Team, 2016), using the nlme and lme4 packages (Bates et al., 2016; Pinheiro et al., 2016). In addition to reporting estimates, we calculated 95% confidence intervals using a bootstrapping approach (1,000 simulations; normal approximation). We also calculated a likelihood-ratio based adjusted pseudo R^2 for each model as implemented in the MuMIn package (Bartoń, 2016). This statistic offers the proportion of the variance explained by comparing models including the explanatory variables with models without them. All other analyses were conducted with SPSS (IBM Corp., 2013).

Results

Preliminary Analyses

Some participants showed almost no variance regarding procrastination over the course of the study (i.e., they worked out or procrastinated in fewer than 2 out of 32 cases). The data of these participants could not contribute to the estimation of within-person changes. Overall, the multilevel analyses were conducted on 4,484 observations (i.e., importance, pleasantness, motivation, difficulty) or 4,481 observations (i.e., mood and confidence) from 325 participants for the workout episodes and 1,958 observations from 299 participants for the procrastination episodes.

Outcome and process focus correlated positively during both workout, $r = .32, p < .001$, and procrastination episodes, $r = .41, p < .001$.

Effects of Goal Focus During Workout and Procrastination Episodes

To investigate whether current goal focus predicted participants' current activity, we fitted a generalized linear mixed-effects model (GLMM, logit link and binomial errors) to the binary outcome variable (0 = procrastinating; 1= working out). The analysis revealed a significant intercept, $B = -2.08, SE = 0.31, z = -6.64, p < .001$, 95% CI [-2.70, -1.48], a significant time effect,[1] $B = -0.31, SE = 0.02, z = -13.36, p < .001$, 95% CI [-0.36, -0.27], and significant positive effects of both process, $B = 0.33, SE = 0.06, z = 5.73, p < .001$, 95% CI [0.22, 0.44], and outcome focus, $B = 0.32, SE = 0.05, z = 6.84, p < .001$, 95% CI [0.23, 0.41]. Translated to changes in odds, the goal focus effects indicate that for a one-unit increase in process focus (outcome focus), the increase of odds of working out was 39% (37%) when holding outcome focus (process focus) constant. The overall goodness of fit (adjusted pseudo-R^2) of the model was .25.

Next, multilevel analyses were conducted to examine the effects of goal focus on various dimensions during the workout. Bivariate correlations between these dimensions as well as the descriptive statistics are displayed in Table 1.

The multilevel analysis with importance as dependent variable revealed significant main effects for process and outcome focus at the within- and between-person level (see Table 2).

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[1] In order to avoid convergence problems, for this analysis, the centered time variable was rescaled to range from -3 to 3.

Table 1
Bivariate Correlations Between Workout Characteristics as Well as Descriptive Statistics

Dimension	1	2	3	4	5	6
1. Importance	-					
2. Pleasantness	.35***	-				
3. Motivation	.44***	.57***	-			
4. Difficulty	-.01	-.35***	-.20***	-		
5. Mood	.20***	.38***	.40***	-.31***	-	
6. Confidence	.18***	.27***	.33***	-.27***	.29***	-
M	5.42	4.60	4.72	3.36	5.72	4.72
SD	1.29	1.33	1.58	1.58	0.99	1.55

Note. $N = 4{,}481$ observations.
***$p < .001$. All significant correlations remain significant after Bonferroni correction.

Specifically, both process and outcome focus were related to the perceived importance of the workout: the higher the process focus on a given day, the more important was the workout to participants, and the higher the outcome focus on a given day, the more important was the workout for the participants as well (within-person effects). This suggests that a stronger than (individual) average focus on either aspect of the exercise goal, be it on the means or the outcome, contributes to the perceived importance of this goal. However, note that participants who focused on average more on the process reported the workout to be more important. The same was true for participants who focused more on the outcome (between-person effects).

The multilevel analysis with pleasantness as dependent variable revealed significant main effects for process and outcome focus at the within-person level (see Table 2). Specifically, the participants reported the workout to be more pleasant on days on which they focused more on the process and more pleasant on days on which they focused more on the outcome (within-person effects). This mimics the effect of goal focus for importance: A stronger than (individual) average focus on either aspect of the goal seems to increase its experienced pleasantness. Additionally, participants who focused more on the process than other participants reported the

Table 2

Parameter Estimates for Multilevel Model of Importance, Pleasantness, and Motivation as a Function of Goal Focus

	Importance					Pleasantness					Motivation				
				CI_{95}					CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	5.34*	0.05	105.41	5.25	5.45	4.54*	0.05	87.98	4.44	4.64	4.61*	0.06	79.01	4.49	4.72
Time	-0.004*	0.001	-2.72	-0.01	-0.001	0.002	0.002	1.35	-0.001	0.01	-0.01*	0.002	-4.54	-0.01	-0.005
Within PF	0.12*	0.02	6.61	0.09	0.16	0.19*	0.02	8.14	0.14	0.23	0.29*	0.02	12.35	0.24	0.34
Within OF	0.11*	0.02	6.94	0.08	0.14	0.04*	0.02	2.45	0.01	0.08	0.08*	0.02	3.94	0.04	0.12
Within PFxOF	-0.003	0.02	-0.19	-0.03	0.03	0.02	0.02	1.12	-0.02	0.05	-0.02	0.02	-0.85	-0.05	0.02
Between PF	0.24*	0.05	5.11	0.15	0.34	0.42*	0.05	8.37	0.32	0.52	0.51*	0.06	9.06	0.40	0.63
Between OF	0.34*	0.04	8.77	0.27	0.42	0.004	0.04	0.09	-0.08	0.08	0.14*	0.05	3.11	0.05	0.24
Between PFxOF	0.03	0.03	0.99	-0.03	0.08	0.02	0.03	0.76	-0.03	0.08	0.03	0.03	0.88	-0.04	0.09
				CI_{95}					CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2															
Intercept	0.68	0.82		0.75	0.90	0.68	0.83		0.75	0.90	0.86	0.93		0.85	1.01
Within PF	0.03	0.19		0.14	0.22	0.06	0.24		0.19	0.28	0.04	0.20		0.14	0.25
Within OF	0.02	0.14		0.10	0.17	0.03	0.16		0.12	0.20	0.03	0.17		0.11	0.21
Within PFxOF	0.01	0.11		0.07	0.14	0.01	0.12		0.07	0.15	0.01	0.11		0.05	0.16
Level 1															
Residual	0.56	0.75		0.73	0.77	0.72	0.85		0.83	0.87	1.02	1.01		0.99	1.03
Pseudo R^2 [a]	0.13					0.10					0.12				

Note. N = 325 persons, 4,484 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus.

[a] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.

* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

workout to be more pleasant (between-person effect). There was no such between-person effect for outcome focus.

Both process and outcome focus were positively related to participants' motivation at both levels of analyses (see Table 2): Although there was a weak but significant overall decrease in motivation over time, participants reported much higher levels of motivation on days on which they focused more on the process than their individual average, and also higher levels of motivation on days on which they focused more on the outcome than their individual average (within-person effects). Again, it seems that a particularly strong focus on either aspect of the exercise goal is related to higher motivation. Similarly, regarding between-person effects, interindividually higher levels of process and outcome focus were positively related to workout motivation.

Regarding difficulty, the results revealed effects particularly at the between-person level (see Table 3). Specifically, participants with a higher average process focus than other participants perceived the workout as less difficult. This effect was more pronounced, when people also focused more on the outcome (between-person interaction). In contrast, outcome focus was positively related to how participants perceived the workout in terms of difficulty at the within-person level. That is, on days on which they focused more on the outcome, they perceived the workout as slightly more difficult.

On days on which participants focused more on the process and the outcome of the workout, they reported a better mood than on days when they reported a lower goal focus (within-person effects). Moreover, participants with a higher average process focus reported a better mood, whereas average outcome focus was not related to mood (between-person effects; see Table 3).

Table 3
Parameter Estimates for Multilevel Model of Difficulty, Mood, and Confidence as a Function of Goal Focus

	Difficulty					Mood					Confidence				
				CI_{95}					CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	3.47*	0.07	49.66	3.33	3.62	5.64*	0.04	133.89	5.55	5.72	4.36*	0.08	55.80	4.21	4.52
Time	-0.02*	0.002	-14.16	-0.03	-0.02	0.003*	0.001	2.43	0.001	0.01	-0.02*	0.001	-12.44	-0.02	-0.01
Within PF	-0.04	0.02	-1.65	-0.08	0.01	0.11*	0.01	7.32	0.08	0.14	0.11*	0.02	6.46	0.08	0.15
Within OF	0.05*	0.02	2.93	0.02	0.09	0.04*	0.01	3.68	0.02	0.07	0.03	0.01	1.71	-0.004	0.06
Within PFxOF	-0.02	0.02	-0.90	-0.05	0.02	-0.02	0.01	-1.74	-0.04	0.002	0.02	0.01	1.59	-0.01	0.04
Between PF	-0.23*	0.07	-3.37	-0.36	-0.09	0.18*	0.04	4.41	0.10	0.25	0.38*	0.08	5.04	0.23	0.53
Between OF	0.08	0.06	1.39	-0.04	0.19	0.05	0.03	1.49	-0.02	0.11	0.03	0.06	0.40	-0.10	0.15
Between PFxOF	-0.12*	0.04	-3.16	-0.20	-0.05	0.03	0.02	1.21	-0.02	0.07	0.08	0.04	1.76	-0.01	0.16
				CI_{95}					CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2															
Intercept	1.31	1.14		1.05	1.25	0.47	0.68		0.62	0.74	1.73	1.32		1.21	1.42
Within PF	0.05	0.22		0.17	0.27	0.02	0.14		0.11	0.17	0.03	0.16		0.11	0.20
Within OF	0.02	0.13		0.08	0.17	0.01	0.09		0.06	0.12	0.02	0.13		0.09	0.16
Within PFxOF	0.02	0.13		0.08	0.17	0.001	0.04		0.01	0.07	0.002	0.04		0.003	0.08
Level 1															
Residual	0.89	0.94		0.92	0.97	0.41	0.64		0.63	0.66	0.55	0.74		0.72	0.76
Pseudo R^2 [a]	0.09					0.81					0.77				

Note. N = 325 persons, 4,484 observations (i.e., difficulty) / 4,481 observations (i.e., mood and confidence). Controlling for time (mean-centered). PF = process focus; OF = outcome focus.

[a] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.

* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

Part II

Process focus was also positively related to the participants' confidence to achieve their workout goals, whereas outcome focus was not: Participants with a higher average process focus than other participants were more confident (between-person effect), and participants were also more confident on days on which they focused more on the process of the workout than on other days (within-person effect; see Table 3).

When participants were procrastinating, they were asked what they intended to do after completing the questionnaire. In $n = 260$ cases (13%), they indicated that they intend to start with the workout. In $n = 1698$ cases (87%), they intended to keep doing what they were doing or to do something else. We fitted a GLMM (logit link and binomial errors) to the binary outcome variable (0 = something else than working out; 1 = working out) and entered process focus, outcome focus, and their interaction regarding the current activity as predictors to the model (controlling for time), again differentiating between effects at the within- vs. between-person levels (adjusted pseudo-$R^2 = .07$). The analysis revealed a significant intercept, $B = -2.74$, $SE = 0.20$, $z = -13.56$, $p < .001$, 95% CI [-4.09, -2.51], a significant time effect,[1] $B = -0.32$, $SE = 0.05$, $z = -6.11$, $p < .001$, 95% CI [-0.47, -0.20], a significant positive effect of process focus at the between-person level, $B = 0.29$, $SE = 0.11$, $z = 2.59$, $p = .010$, 95% CI [0.09, 0.52], and an interaction between process and outcome focus at the between-person level, $B = -0.19$, $SE = 0.06$, $z = -3.11$, $p = .002$, 95% CI [-0.29, -0.02]. Translated to changes in odds, the main effect for process focus indicates that for a one-unit increase in average process focus, the increase of odds of the intention to work out instead of doing something else was 34% when holding all other predictors constant. However, an increase in outcome focus attenuated this effect (between-person interaction). For example, for an average process focus of 2 and an average outcome focus of 1, the increase of odds of the intention to work out would be 48%, whereas for an

average process focus of 2 and average outcome focus of 3 it would be only 1%.

Effect of Goal Focus on Overall Measures, Final Assessment, and Objective Measures

Interactions between process and outcome focus were largely absent in the previous analyses. As we did not expect any interactions in the subsequent analyses, we included only main effects of process and outcome focus in the subsequent analyses. First, a multiple linear regression was performed to test whether average process and outcome focus during workout predicted the total number of completed workout sessions. The analysis revealed that process focus positively predicted the number of workout sessions, $B = 1.05$, $SE\ B = 0.51$, $\beta = 0.12$, $p = .039$, 95% CI [0.09, 2.06], whereas outcome focus did not, $B = -0.38$, $SE\ B = 0.42$, $\beta = -0.06$, $p = .359$, 95% CI [-1.25, 0.43]; intercept: $B = 10.47$, $SE\ B = 2.56$, $p < .001$, 95% CI [5.31, 16.09]. However, the regression equation with the two predictors was not significant, adjusted $R^2 = .007$, $F(2,322) = 2.16$, $p = .117$. When considering only participants who completed the study, the results were comparable (process focus: $B = 1.14$, $SE\ B = 0.52$, $\beta = 0.15$, $p = .030$, 95% CI [0.16, 2.13]; outcome focus: $B = -0.23$, $SE\ B = 0.44$, $\beta = -0.04$, $p = .605$, 95% CI [-1.23, 0.71]; intercept: $B = 12.56$, $SE\ B = 2.66$, $p < .001$, 95% CI [6.39, 18.19]; adjusted $R^2 = .012$, $F(2,235) = 2.43$, $p = .090$). Given the relationship between process focus and the number of workout sessions, the following analyses controlled for the number of workout sessions. This was also because the number of completed workout sessions is likely related to the outcomes assessed in the final questionnaire and post-study fitness test.

At the beginning of the study, participants specified a goal they wanted to achieve with the workout by the end of the study. In the final questionnaire, $n = 135$ participants indicated that they had achieved their personal goal, whereas $n = 107$ had not. We conducted a logistic regression with this binary outcome (0 = goal not achieved/no longer achievable; 1 = goal

achieved). In a first step, we entered the control variable number of workouts in the regression model. The analysis revealed that participants who completed more workout sessions were also more likely to achieve their goals ($B = 0.11$, $SE = 0.02$, Wald(1) = 31.63, $p < .001$, 95% CI [0.07, 0.15]; $\chi^2 = 37.63$, $p < .001$ with $df = 1$, McFadden $R^2 = 0.11$). Next, average process and outcome during workout were added as predictors. McFadden R^2 indicated that these variables were able to account for 14% of the variability in the outcome ($\chi^2 = 40.74$, $p < .001$ with $df = 3$). Specifically, the number of completed workout sessions still significantly predicted whether participants achieved their personal goals, $B = 0.11$, $SE = 0.02$, Wald(1) = 29.72, $p < .001$, 95% CI [0.07, 0.15]. However, average process focus during workout only marginally predicted personal goal achievement, $B = 0.25$, $SE = 0.14$, Wald(1) = 2.89, $p = .089$, 95% CI [-0.07, 0.56]: A one-unit increase in average process focus increased the odds of achieving the personal goal by 28% when holding all other predictors constant. Average outcome focus did not predict whether participants achieved their goals or not, $B = -0.12$, $SE = 0.12$, Wald(1) = 0.99, $p = .32$, 95% CI [-0.39, 0.13]; intercept: $B = -2.16$, $SE = 0.79$, Wald(1) = 7.55, $p = .006$, 95% CI [-3.81, -0.70].[2]

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[2] The analysis was also computed without controlling for the effect of number of workout sessions. Average process focus during workout predicted personal goal achievement, $B = 0.32$, $SE = 0.14$, Wald(1) = 5.54, $p = .019$, 95% CI [0.05, 0.62]: A one-unit increase in average process focus increased the odds of achieving the personal goal by 38% when holding outcome focus constant. Average outcome focus did not predict whether participants achieved their goals or not ($B = -0.13$, $SE = 0.12$, Wald(1) = 1.37, $p = .242$, 95% CI [-0.37, 0.07]; intercept: $B = -0.70$, $SE = 0.67$, Wald(1) = 1.08, $p = .299$, 95% CI [-2.13, 0.65]; $\chi^2 = 5.84$, $p = .054$ with $df = 2$, McFadden $R^2 = 0.03$).

A multiple linear regression was conducted to investigate whether average process and outcome during workout were significantly related to participants' overall workout satisfaction over and above the effect of number of completed workout sessions. In a first step, the control variable number of workouts was entered into the regression model. Participants who completed more workout sessions reported a higher workout satisfaction: $B = 0.12$, $SE\ B = 0.01$, $\beta = 0.61$, $p < .001$, 95% CI [0.10, 0.14]; adjusted $R^2 = .37$, $F(1,236) = 138.23$, $p < .001$. Next, the two goal focus variables were added to the model. The linear combination of the three predictors was significantly related to overall workout satisfaction, adjusted $R^2 = .41$, $F(3,234) = 56.82$, $p < .001$. Specifically, the number of workout sessions, $B = 0.11$, $SE\ B = 0.01$, $\beta = 0.58$, $p < .001$, 95% CI [0.09, 0.13], and average process focus during workout, $B = 0.35$, $SE\ B = 0.08$, $\beta = 0.24$, $p < .001$, 95% CI [0.19, 0.51], were positively associated with workout satisfaction. In contrast, average outcome focus during workout was not related to workout satisfaction, $B = -0.03$, $SE\ B = 0.07$, $\beta = -0.03$, $p = .63$, 95% CI [-0.16, 0.10]; intercept: $B = 1.21$, $SE\ B = 0.41$, $p = .004$, 95% CI [0.34, 2.12].

Regarding the four objective measures (i.e., plank, squat, push-ups, high knees) assessed in the pre- and post-study fitness test, we conducted four hierarchical multiple linear regressions to investigate whether average process and outcome focus during workout predicted personal pre-post improvement over and above the number of workout sessions. The results displayed in Tables 4 (i.e., plank and squat) and 5 (i.e., push-ups and high knees) indicate that the participants improved on all four objective measures. However, significant effects of average goal focus were only found for the improvement in push-ups. Specifically, the more participants on average focused on the process of the workout, the more they improved (over and above the significant positive effect of the number of workout sessions).

Table 4
Multiple Regression for Prediction of Personal Difference in Plank and Squat (Post Minus pre in Seconds) by Average Goal Focus

	Plank						Squat					
					CI_{95}						CI_{95}	
Variable	ΔR^2	*B*	*SE*	*t*	Lower	Upper	ΔR^2	*B*	*SE*	*t*	Lower	Upper
Step 1	.002 [a]						.00002 [a]					
Intercept		19.78*	3.10	6.38	13.81	25.75		22.18*	3.18	6.97	16.16	28.64
Nr. of workouts		-0.12	0.16	-0.74	-0.46	0.21		-0.01	0.17	-0.07	-0.34	0.32
Step 2	.002 [a]						.005 [a]					
Intercept		15.47*	7.10	2.18	0.89	28.48		23.50*	7.29	3.23	9.58	36.64
Nr. of workouts		-0.13	0.17	-0.81	-0.47	0.19		0.01	0.17	0.06	-0.33	0.35
Process focus		0.68	1.32	0.51	-1.64	2.97		-1.20	1.36	-0.89	-3.79	1.45
Outcome focus		0.27	1.11	0.24	-2.01	2.55		0.91	1.14	0.80	-1.33	3.13

Note. $N = 227$. [a] $p > .05$.
* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

Table 5
Multiple Regression for Prediction of Personal Difference in Push-Ups and High Knees (Post Minus pre in Repetitions) by Average Goal Focus

	Push-ups[a]						High knees[b]					
					CI_{95}						CI_{95}	
Variable	ΔR^2	*B*	*SE*	*t*	Lower	Upper	ΔR^2	*B*	*SE*	*t*	Lower	Upper
Step 1	.05[c]						.00001[d]					
Intercept		5.23*	1.16	4.53	3.09	7.41		14.72*	1.61	9.14	11.71	17.88
Nr. of workouts		.20*	0.06	3.24	0.07	0.33		-0.004	0.08	-0.04	-0.17	0.14
Step 2	.02[c]						.02[d]					
Intercept		0.38	2.59	0.15	-4.08	4.51		15.71*	3.67	4.28	8.90	22.84
Nr. of workouts		0.18*	0.06	2.91	0.05	0.31		0.02	0.09	0.20	-0.14	0.17
Process focus		1.08*	0.48	2.24	0.18	2.03		-1.17	0.68	-1.73	-2.42	0.05
Outcome focus		-0.02	0.41	-0.04	-1.08	0.85		0.95	0.57	1.67	-0.09	2.12

Note. [a] $N = 226$. [b] $N = 225$. [c] $p = .001$. [d] $p > .05$.
* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

Discussion

The current research investigated the association between goal focus and people's procrastination (here: workout adherence). Both a higher process and outcome focus on the current activity increased the likelihood that people worked out at times they had planned to do so. However, only average process focus during the workout predicted the total number of workout sessions at the end of the study. Moreover, this study examined how goal focus is related to how people experience the workout in real time and to different workout-related outcomes. Both process and outcome focus had unique positive effects on the perceived importance and pleasantness of the workout, and also individually contributed to participants' motivation and mood. However, whereas participants perceived the workout as more difficult on days on which they focused more on the outcome of the workout, a higher average process focus was negatively related to perceived difficulty. The effect of process focus was stronger in combination with a higher average outcome focus, suggesting that the adaptiveness of outcome focus depends on the level of analysis, i.e., whether one is interested in *intra-* or *inter*individual differences. Moreover, only process focus was related to participants' confidence to achieve their desired outcomes. Thus, ironically, the more people focus on *how* they work out, the more confident they are that they will get to their outcomes. In fact, participants with a higher process focus during the workout than other participants were somewhat more likely to achieve their goals and reported a significantly higher overall workout satisfaction at the end of the study. In contrast, outcome focus was unrelated to either outcome.

The findings of this study match with previously reported positive effects of adopting a process focus (e.g., Freund & Hennecke, 2012; Freund et al., 2010; Hennecke & Freund, 2014). Regarding the goal to start working out regularly, Freund et al. (2010) found that process focus

was positively related to positive affect, increased attainability, importance, and satisfaction as well as higher goal involvement over a period of four months. Process focus was also positively related to different measures of goal pursuit (self-reported exercise frequency and regularity). However, their study consisted of only two measurement occasions and the measures were not obtained while participants were exercising. The current experience sampling study thus extends previous research by pointing to more immediate positive effects of process focus on workout evaluation, mood, and motivation.

The finding that outcome focus was irrelevant regarding the overall measures (i.e., number of workout sessions, goal achievement, workout satisfaction, and objective improvement) is also consistent with the study of Freund et al. (2010). These authors found that outcome focus was not or even negatively related to measures of positive evaluation of the goal and goal pursuit. In contrast, however, regarding the more immediate measures, the results of the current experience sampling study do not support the idea that outcome focus is maladaptive. Although the current study corroborates the relative superiority of process over outcome focus, a higher outcome focus was particularly adaptive regarding the perceived importance of the workout and participants' motivation.

The Adaptiveness of Process and Outcome Focus

The adaptiveness of both process and outcome focus is in line with a study by Pham and Taylor (1999) showing that focusing on both process and outcome focus is more beneficial for motivation than focusing on the process only. Furthermore, our findings can be interpreted as being in line with research on mental contrasting (e.g., Adriaanse et al., 2010). In mental contrasting, both the positive outcome people want to achieve in the future and the negative reality become mentally accessible and they form a strong mental association. It has been argued

that mental contrasting aids the identification of obstacles or critical cues. Thus, this strategy entails both a focus on the outcome (i.e., the desired future) and process (i.e., identification of obstacles and critical cues) of goal pursuit. Importantly, in the current study, the effects of process and outcome focus were simultaneously estimated. Therefore, the effect of each of the two foci can be interpreted as independent of the effect of the other. Together with the virtual absence of interactions, our findings favor additive over synergistic effects of the two foci. As Little (1989) pointed out, people do not only want to know why they are doing something but also what they should be doing. Thus, it seems that focusing one's attention to both aspects of a goal may be adaptive. Note, that process and outcome focus correlated positively with each other during workout sessions ($r = .23$, $p < .001$). Nevertheless, the wide range of correlations reported in previous studies from non-significant ($r = .07$; Freund et al., 2010) to large effects ($r = .70$, $p < .001$; Freund & Hennecke, 2012) calls for further exploration of moderators of this association. For example, Freund and Hennecke (2012) suggested that people are likely to think much about both the process and the outcome of goal pursuit when a goal is subjectively very important. This is in line with the significant positive association between the two foci and the perceived importance of the workout in the present study.

Although we found that outcome focus was rather adaptive during the intended workout, it may become maladaptive when people are procrastinating. Specifically, when participants were not working out as planned, they reported a stronger intention to start with the workout after completing the questionnaire when focusing more on the process. However, a higher outcome focus weakened this intention. Behavioral intentions do not necessarily predict behavior but a higher outcome focus during procrastination episodes may be related to people rationalizing their behavior and thus be maladaptive for goal pursuit (Kaftan & Freund, in press).

Objective Improvement

Process focus was strongly related to participants' improvement in the number of push-ups. However, goal focus was not related to their performance in the other three test exercises. The fact that also the number of completed workout sessions was not related to participants' improvement on the objective measures may indicate that other factors such as training intensity are more relevant predictors in this context. However, as both the number of workout sessions and process focus predicted whether people achieved their personal goals and their overall workout satisfaction, it may also mean that people did not want to improve on the objective measures (or only regarding the push-ups, which maybe was their favorite exercise) but instead had other outcomes in mind or regarded their current fitness level as something they want to maintain. Indeed, an inspection of the goals people had set for themselves included goals such as "test my perseverance," "stay healthy," "reduce stress," "have fun," or "improve my body awareness." Yet another possible explanation is that the participants had worked out outside of the planned workout windows. However, we tried to avoid this by allowing them to change their time windows over the course of the study such that they could dynamically integrate the workout into their daily plans.

Dynamic Changes of Goal Focus

Although goal focus explained a substantial amount of variance in the immediate experience of the workout, the unexplained residual variance also highlights that we have identified but one out of possibly many factors related to the evaluation of the workout, participants' mood, and motivation. Moreover, we observed some interindividual variability in magnitude and direction of the investigated associations. A more detailed inspection of these interindividual differences at the within-person level revealed that they were particularly present

regarding the individual level (i.e., intercepts), and less regarding the changes (i.e., slopes). This suggests that the mechanism underlying the effects of goal focus on the perception of the workout equally apply to most people. Similarly, the effects of goal focus at the between-person level tended to be stronger than the effects at the within-person level. However, the fact that the within-person effects were still significant when controlling for the between-person effects suggests that goal focus changes dynamically and influences the immediate evaluation of the workout. That is, different levels in average process focus explain why one person tends to perceive the workout as, for example, rather unpleasant and a second person as rather pleasant. However, for both individuals it is true that, on days they focus more on the workout itself (i.e., on the process), they perceive it as more pleasant than they personally do on an average day. Against this backdrop, future research should explore whether these patterns can be confirmed in different contexts and regarding different activities.

Additional Explanatory Power of Goal Focus

What are the potential implications of this study for interventions helping people to follow through with their goals? It seems that people would profit from zooming in on their goals by focusing both on the process and the outcomes in order to avoid procrastination. However, there are only very few studies that induced goal focus (see Krause & Freund, 2016; Pham & Taylor, 1999). Can people be taught to adjust their goal focus to further their goal pursuit? In order to strengthen the process focus, it might help to increase the concreteness of a goal, offer information about the means to pursue a goal, and form implementation intentions (Achtziger, Gollwitzer, & Sheeran, 2008; Gollwitzer, 1990). People who use strategies such as detailed action planning also procrastinate less (Wieber & Gollwitzer, 2010), are more likely to engage in intended physical activity (Sniehotta, Scholz, & Schwarzer, 2005), and show greater

performance improvements (Smith, Hauenstein, & Buchanan, 1996). This study suggests that it may also be worthwhile to help people to focus their attention on the activity itself while they are carrying out the intended activity.

Despite the promising results of this study, some limitations merit mention. Apart from mood, we assessed the constructs with single items to not overburden the participants. However, this limits the reliability of the measures. Although the experience sampling method has several advantages over lab-based studies (i.e., less issues of external validity), it also has its downsides. For example, our questionnaires may have operated as an intervention and influenced people's behavior. Moreover, causal inferences cannot be drawn without an experimental setting.

Conclusions

Many people pursue the goal to exercise regularly. Given the low adherence rates associated with physical exercise, it is important to identify determinants of this health behavior to direct intervention research and help people to achieve their goals (Dishman & Sallis, 1994). The study consistently showed that adopting a process focus is helpful for goal pursuit and affective well-being both at a proximal (e.g., people perceive the workout as more pleasant while working out) and aggregated level (e.g., people work out more often; see also Freund et al., 2010). Moreover, this study is the first to also show immediate positive effects of adopting an outcome focus in a real-life setting (e.g., people are more motivated). However, the results regarding outcome focus were more mixed: Outcome focus was not related to the overall outcomes (i.e., number of workout sessions, goal achievement, and overall workout satisfaction) and even maladaptive once people were procrastinating.

PART III: A MOTIVATIONAL PERSPECTIVE ON ACADEMIC PROCRASTINATION: GOAL FOCUS AFFECTS HOW STUDENTS PERCEIVE ACTIVITIES WHILE PROCRASTINATING

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Part III

Abstract

This 14-week longitudinal study with weekly real-time reports investigated if goal focus (i.e., a focus on the process vs. the outcome of goal pursuit) is associated with students' (N = 105) perceptions of the activities in which they were engaged while procrastinating (*alternative activities*). We compared perceptions of the alternative activities with the *focal activity* (here: working on a bachelor's thesis) as well as to a baseline perception of the alternative activity. More specifically, we considered the perceptions of the alternative activities regarding their importance, pleasantness, guilt, stressfulness, delay of gratification, and the motivation to engage in them. Multilevel analyses differentiating between relationships at the within- and between-person level showed that process and outcome focus exert distinct influences on the perceptions of activities and that outcome focus is a stronger predictor than process focus. Outcome focus was positively related to importance and stress, and negatively to pleasantness, guilt, and motivation. In contrast, process focus was positively associated with pleasantness and motivation, and negatively with guilt. While students perceived alternative activities as rewarding at a later point in time when they focused more on the outcome, they perceived these activities as more immediately gratifying when they focused more on the process.

Introduction

Imagine two students, Anna and Bill, who share the goal of submitting a bachelor's thesis in time in order to complete their college degree. For both, Thursday afternoon is the only time they can fully devote to their theses, and they plan to do so each week. However, now that it is Thursday, Bill and Anna put off writing their theses and pursue their relatively less important goal of working out – a classic instance of procrastination (e.g., Steel, 2007). Whereas Bill focuses on proper workout techniques, Anna focuses on how much weight she might lose. In other words, one of the two students focuses primarily on the "how" or the *process* of goal-directed behavior (e.g., proper workout techniques), the other on the "why" or the *outcome* of goal pursuit (e.g., weight loss). The concept of goal focus (Freund & Hennecke, 2015) denotes this distinction between the salience of the process (i.e., process focus) and the salience of the ends of goal pursuit (i.e., outcome focus).

This study tested the hypothesis that goal focus is associated with how students evaluate the activities in which they engage during procrastination episodes (i.e., alternative activities) in absolute terms and compared with how they evaluate the same activities when they do not procrastinate (i.e., as compared with a baseline rating). In the above example: as how important and pleasant do Anna and Bill perceive the work out at the gym when they procrastinate working on their theses (i.e., in absolute terms), and compared with when they go to the gym on any other day (i.e., as compared with when they do not procrastinate)? In addition, we investigated the influence of goal focus on evaluations of the alternative activities relative to the evaluations of the bachelor's thesis that students procrastinate (i.e., the focal activity). In the above example: as how important and pleasant do Anna and Bill perceive the workout at the gym when they procrastinate as compared with working on their theses?

Part III

Although procrastination implies the delay of one activity in favor of another, research has only just begun to systematically assess characteristics of both focal and alternative activities, and how they relate to each other to better understand the processes underlying procrastination (e.g., Giguère et al., 2016). In the current study, we chose the writing of a bachelor's thesis as the focal activity because academic procrastination is frequent. For instance, students often put off writing a term paper (Solomon & Rothblum, 1984) because this activity may be perceived as stressful, frustrating, boring, or a combination thereof (Pychyl et al., 2000). In addition, students typically have a great deal of autonomy as to when to work on their papers, and are often given fairly loose deadlines, which is known to contribute to procrastination (Ariely & Wertenbroch, 2002). Most of this is also true for writing a bachelor's thesis, a relatively ill-structured task with a deadline that lies many months in the far-seeming future.

Procrastination: Definition and Causes

Procrastination is defined as the purposive delay of an intended course of action despite the expectation to be worse off for the delay (Steel, 2007). Procrastination can occur in all phases of the motivational process: during goal choice, goal planning, and goal striving (Steel & Weinhardt, 2017; see also Krause & Freund, 2014b). The current research addresses procrastination during goal striving (in this case, writing a bachelor's thesis), that is, during the actional phase in the Rubicon model of action phases (Gollwitzer, 1990; H. Heckhausen & Gollwitzer, 1987).

Over the last two decades, there has been an increasing interest in the *causes* of procrastination, revealing characteristics of the focal activity as a major predictor. In a meta-analysis, Steel (2007) identified task aversiveness as the strongest predictor pertaining to task characteristics: the more unpleasant a task is, the more likely are people to put it off. This fits

well with the finding that emotional distress may shift priorities toward the immediate present with the aim to avoid distress (e.g., Tice, Bratslavsky, & Baumeister, 2001). That is, people may find it more appealing to engage in an alternative, enjoyable activity instead of the aversive focal activity. This has also been addressed as a sign of impulsiveness or a lack of being able to delay gratification, as more immediately rewarding activities may distract people from pursing the focal goal (e.g., Steel, 2007). Increasing the perceived importance of the focal activity may be one way of counteracting this tendency (Trope & Fishbach, 2000). When failing to do so, procrastinating the focal activity may be accompanied by feelings of guilt (e.g., Pychyl & Little, 1998).

In sum, these findings suggest that the evaluation of activities in terms of importance, pleasantness, guilt, stressfulness, immediate/delayed rewards (i.e., delay of gratification), and the general motivation to engage in these activities is crucial for our understanding of procrastination. In the following, we argue that these characteristics are not stable but dynamic, thus warranting the exploration of potential predictors (here: goal focus) of these changes.

The Dynamic Nature of Activity Characteristics and Goal Focus

Although procrastination is often considered to be a trait-like characteristic (e.g., Schouwenburg & Lay, 1995), recent research has revealed situational determinants and led to a more dynamic understanding of procrastination, allowing to explore perceptions of activities at the moment of immediate experience as people work toward or procrastinate on a particular project. Pychyl et al. (2000; see also Ferrari, Mason, & Hammer, 2006) found that activity ratings between alternative activities in which students were engaged while procrastinating (e.g., watching TV) and focal activities they felt they should be doing (e.g., studying for a statistics exam) differed significantly. Specifically, the procrastinated focal activities were rated as being

less pleasant, more confusing, more difficult, more stressful, and much more important. Participants continued to appraise the focal activities as very important when they were actively engaged in them. However, they rated them as significantly more pleasant and less stressful, difficult, and confusing than they had anticipated when they were avoiding them through procrastination. Thus, the findings of the study by Pychyl et al. suggest that people perceive focal activities differently when they are procrastinating compared with when they are not.

What about the evaluation of the alternative activities people engage in while procrastinating in real-life situations? Does the evaluation of alternative activities also shift on such dimensions as pleasantness or importance when people engage in them while procrastinating the focal activity (i.e., writing the thesis)? And does goal focus predict the perception of alternative activities? To approach these questions, we build on previous research, which has identified goal focus as a relevant construct in the context of self-regulation (for an overview see Freund et al., in press). Goals can be defined as the association of means (process) and ends (outcome; e.g., Kruglanski et al., 2002). Goal focus denotes the salience of the process or the outcome of goal pursuit: *Process focus* relates to the degree to which the means of goal pursuit are in the focus of attention, whereas *outcome focus* relates to the degree to which the ends of goal pursuit are in the fore (Freund & Hennecke, 2015). Prior short-term longitudinal studies on such goals as regular physical exercise or losing weight have found that a stronger process focus is more adaptive for subjective as well as objective indicators of successful goal striving (Freund & Hennecke, 2012; Freund et al., 2010; Hennecke & Freund, 2014). Turning to procrastination, first evidence suggests that a process focus on focal activities is also negatively linked to procrastination (Krause & Freund, 2016). Moreover, similar to activity characteristics, goal focus can be considered a dynamic construct (Krause & Freund, 2014b) and likely

influences how people evaluate activities (see Fujita & Sasota, 2011). Given that the aversiveness of goal-relevant means is often considered one of the factors contributing to procrastination, Krause and Freund (2016) investigated the link between goal focus and the aversiveness of the focal activity. Contrary to their expectation that a stronger process focus might increase the perceived aversiveness of the means, they found a positive association of aversiveness of the focal activity with a stronger outcome focus. As of yet, there is no research on the relationship between goal focus and the evaluation of the *alternative* activities. This is the focus of the current article that approaches procrastination by investigating how people perceive the activity in which they engage while procrastinating.

Goal Focus and the Evaluation of Alternative Activities

Overall, we hypothesized that outcome focus is more strongly associated with the evaluations of alternative activities than process focus. Specifically, we assume that one is more likely to be aware of procrastinating when asking oneself why one engages in an alternative activity (i.e., when adopting a stronger outcome focus). This, in turn, should more generally lead to changes in the perception of these activities during procrastination episodes (compared with baseline evaluations of the same activities while not procrastinating). This might be the case because higher level construals of a given goal (i.e., focusing on the outcome) have been shown to generalize to other goals (e.g., Fujita & Sasota, 2011). To return to our opening example, when Anna focuses on the outcome of losing weight while exercising instead of working on her bachelor's thesis, she is more likely to be confronted with the fact that working out does not help her to advance her thesis. This, in turn, likely affects the perceived importance of losing weight (over advancing the bachelor's thesis).

In contrast, focusing on the activity itself (i.e., a higher process focus) should allow people to better block out that they are currently procrastinating. By virtue of lowering the awareness of procrastinating, focusing on the process of the alternative activity should lead to less pronounced changes in its evaluation. For instance, when Bill focuses on how to best perform the workout exercises, he is less likely to reflect upon the fact that he ought to work on his bachelor's thesis. By focusing his attention on the process of exercising, the likelihood of comparing the exercises to the process of working on his thesis is low.

In the following sections, we elaborate on potential influences of outcome and process focus on perceptions of alternative activities separately. This is in line with previous studies that have found no or only a weak relation between process and outcome focus (Freund et al., 2010; Krause & Freund, 2016). Table 6 summarizes the hypothesized relationships between goal focus

Table 6
Hypothesized Relationships Between Goal Focus and Different Characteristics of Alternative Activities in Absolute Terms, Relative to Baseline, and Relative to Focal Activity

	Outcome focus			Process focus		
Dimension	Absolute	Relative to baseline	Relative to focal activity	Absolute	Relative to baseline	Relative to focal activity
Importance	+ [a]	+ [b]	– → + [c]	+ [a]	0 [b]	– → – (+) [c]
Pleasantness	–	–	+ → 0	+	0	+ → + (+)
Guilt	–		+ → –	–		+ → + (–)
Stress	+		– → – (+)	e		e
Motivation	e		e	+		+ → + (+)
Delay of gratification	+		– → – (+)	–		– → – (–)

Note. [a] + = positive association; – = negative association; e = exploratory.
[b] Alternative activities are rated more (+) / equally (0) / less (–) favorable on the respective dimension during procrastination episodes as compared to baseline when the respective focus is high.
[c] Signs before the arrows indicate higher (+) / lower (–) values for alternative activities as compared to the focal activity when the respective focus is *low*. Signs after the arrows indicate higher (+) / equal (0) / lower (–) values for alternative activities as compared to the focal activity when the respective focus is *high*. Signs in brackets indicate direction of change from low to high values on the respective focus when signs before and after brackets are the same; e = exploratory.

and characteristics of the alternative activity, differentiating between the perception of alternative activities in absolute terms, relative to baseline (for importance and pleasantness), and relative to the procrastinated focal activity (i.e., working on the thesis).

Outcome focus.

Importance. We use the term "importance" as attainment value attached to the outcome of goal pursuit (Eccles & Wigfield, 2002) and interchangeably with the term "meaning" (e.g., Ferguson & Sheldon, 2010). Adopting an outcome focus relates to the meaning, the why, or importance of the outcome of goal pursuit. Thus, we hypothesized that a higher outcome focus increases the salience of the importance of the alternative activity during procrastination. By definition, the alternative activity has been assigned a lower overall priority than the focal activity. Thus, students likely have to deliberatively rationalize not working on their theses by perceiving a higher importance of the alternative activity. More specifically, when students focus more on the outcome of alternative activities during procrastination episodes, they should rate these activities as more important in absolute terms, as more important compared with when they are not procrastinating (i.e., a baseline rating of the activities), and maybe even as more important than the focal activity (i.e., working on the bachelor's thesis).

Guilt. Studies have found a positive association between procrastination and guilt (Pychyl et al., 2000; Pychyl & Little, 1998). In line with an emotion regulation perspective on procrastination (e.g., Pychyl & Sirois, 2016), we posit that people try to downregulate the negative emotions such as guilt associated with procrastination. One way to downregulate guilt is to increase the perceived importance of the alternative activities. This mechanism is akin to "self-indulgent reconstruals" (Anderson, 2016, p. 51). Therefore, we hypothesized a negative relationship between outcome focus and guilt. If the increased importance serves as a guilt-

relieving justification of procrastination (Kroese & De Ridder, 2016), students may even perceive alternative activities as less guilt provoking than the focal activity. In other words, students might feel that they are doing the "right thing" when they are procrastinating with an alternative activity that seems highly important at the time. For instance, exercising may suddenly seem very important for one's physical and psychological well-being and temporarily justify procrastinating on the bachelor's thesis.

Pleasantness and stress. An outcome focus implies to focus on why one is engaged in an activity (Freund & Hennecke, 2015), and might thus heighten the awareness of not acting in accordance with one's standards, values, or goals. Therefore, we hypothesized that a higher outcome focus lowers the pleasantness of the alternative activity. In fact, definitions of procrastination often assume an emotional discomfort (e.g., Solomon & Rothblum, 1984) and stress (for an overview, see Sirois, 2016b). Adopting an outcome focus should lead to more stress and less enjoyment (also compared with baseline) of the alternative activity. For example, watching TV might be less fun when being aware that one ought to work on the bachelor's thesis instead. Furthermore, while students who do *not* focus on the outcome should perceive alternative activities as more pleasant and less stressful as the focal activity, this difference should decrease with a higher outcome focus. In other words, when the outcome focus is strong, procrastination may partly lose its short-term mood-regulatory function (Tice & Baumeister, 1997). This assumption is also in line with research on desire enactment, which suggests that yielding to temptation results in "spoiled pleasure" (e.g., Hofmann, Kotabe, & Luhmann, 2013).

Delay of gratification. When adopting an outcome focus, alternative activities might lose their appeal of being immediately rewarding (e.g., Sirois, 2016b). Freund and colleagues (in press) have linked goal focus to cognitive construal level (Trope & Liberman, 2010) by

connecting outcome focus to more abstract and process focus to more concrete representations of goals. If a goal is construed more abstractly, its perceived distance increases (Liberman, Trope, McCrea, & Sherman, 2007). Thus, with a higher outcome focus, the distance of the reward linked to a given alternative activity should increase, thereby reducing the discrepancy between the alternative and the focal activity that students usually associate with a delayed reward (e.g., a good grade at the end of the semester).

Motivation. There are two alternative hypotheses regarding the effect of outcome focus on the motivation to engage in alternative activities. On the one hand, focusing on the desired outcome of the activity may reduce its intrinsic appeal (Freund & Hennecke, 2015), and the hypothesized lower pleasantness and higher stress might lead to decreases in the motivation to engage in the activity. On the other hand, the expected increase in importance and decrease in guilt might motivate students to maintain their engagement in the alternative activity. The current study tested these two hypotheses.

Process focus.

Pleasantness and delay of gratification. When procrastinating, students often engage in immediately gratifying pleasant alternative activities to avoid an aversive focal activity and improve their mood (Pychyl & Sirois, 2016). However, the factors that facilitate an escape from the negative emotions associated with the distressing focal activity are not yet fully understood. Sirois (2014a) suggested that becoming absorbed in the alternative activity is one way to facilitate mood repair (see also "mindless procrastination," Kroese et al., 2016, p. 101). Similarly, we hypothesized that a higher process focus increases the salience of the pleasantness and immediate gratification of the alternative activity. When adopting a process focus, students should be better able to block out that they are procrastinating and enjoy the activity more in

absolute terms and to the same extent they normally do. In addition, the more students focus on the process of the alternative, the larger the difference between the perception of the alternative and the focal activity should be. That is, students with a high process focus should perceive alternative activities as more immediately rewarding and more pleasant than the focal activity.

Importance. We expected a similar, yet weaker effect of adopting a stronger process focus on importance than of adopting a stronger outcome focus. A stronger process focus is likely associated with an increase in the salience of the effort a person puts into goal pursuit (Freund & Hennecke, 2015). This, in turn, should increase the perceived value or importance of the activity (Kruger et al., 2004). Thus, if alternative activities are effortful (e.g., cleaning, working out) and the effort of the activity comes into the fore when adopting a process focus, the alternative activity might also be perceived as more similar to the focal activity in terms of importance and compared with the general rating of the same activity (i.e., the baseline rating of the activity when not procrastinating).

Guilt. We hypothesized that a stronger process focus is negatively related to guilt. Again, in line with an emotion regulation perspective on procrastination (e.g., Pychyl & Sirois, 2016), a higher process focus or being absorbed in alternative activities might make people temporarily "forget" about the fact that they are procrastinating and lower feelings of guilt (Sirois, 2014a). Additionally, the assumed increased salience of the invested effort when engaged in effortful alternative activities may promote the experience of doing something important and also reduce feelings of guilt.

Motivation. A higher process focus should be associated with a higher motivation to engage in alternative activities. The hypothesized increases in importance, pleasantness, and the reduction in guilt are all factors that should contribute to a high motivation. Relative to the focal

activity, focusing more strongly on the process should be associated with a higher motivation to engage in alternative activities.

Stress. There are two alternative hypotheses with regard to the relationship between process focus and experienced stress. On the one hand, a higher process focus might decrease the awareness of doing the "wrong thing" and thereby lower feelings of guilt. Moreover, when engaging in the alternative activity is so absorbing that it is not perceived as threatening the desired outcome of the focal activity, stress should also decrease (Folkman & Lazarus, 1985). On the other hand, a higher process focus has been suggested to go hand in hand with a higher perceived investment and monitoring behavior (Freund & Hennecke, 2015). As elaborated above, the effort of the activity might come into the fore when adopting a process focus. Effort, in turn, can be positively associated with stress (Vasalampi, Salmela-Aro, & Nurmi, 2010). Depending on which effect is stronger, the association between process focus and stress may be positive, negative, or the opposing effects may nullify each other.

To test the proposed associations, we assessed procrastination in a real-life study situation over the course of 14 weeks with students working on their bachelor's theses. Participants were asked to rate different activities at baseline in terms of importance and pleasantness. They provided adjustable individual time windows during which they planned to work on their theses. During these time windows, we sent them a questionnaire and asked them to report their current activity and to rate the alternative and focal activity on various dimensions. This design allowed us to investigate how students perceived activities in absolute terms, relative to baseline (for importance and pleasantness), and relative to the thesis.

Part III

Methods

Sample

The study targeted bachelor's degree students who shared the goal of submitting a bachelor's thesis in about three to four months. Participants were recruited via advertisements in Internet forums (e.g., University of Zurich students' forums) and mailing lists of different universities in the German-speaking part of Switzerland, Austria, and Germany. The recruitment advertisement included a link to an online baseline questionnaire, which was created and published using an online questionnaire tool (SoSci Survey; see www.soscisurvey.de).

To determine the sample size, we used the simr package (Green, MacLeod, & Alday, 2016) in R to run Monte Carlo simulations. Given that this is the first study exploring the relationship between goal focus and activity perceptions, we took a conservative approach and assumed a small effect size of 0.15 (i.e., size of fixed effects). The simulations suggested that the conventional power level of 80% is only attained once the sample size approaches $N = 100$. Hence, we aimed at a final sample of at least 100 participants, oversampling by approximately 20% to account for potential dropouts. The original sample consisted of 118 bachelor's students. We excluded $n = 13$ participants (who had multiple accounts, only completed the baseline questionnaire, did not fill out any questionnaire in time, or canceled the thesis after 1 week), leaving a total of $N = 105$ students (82% women) aged 21 to 31 years ($M = 23.30$, $SD = 2.00$). Most of the participants were from Switzerland (73.3%), and the rest from Austria (13.3%), and Germany (13.3%). Most participants were psychology students (41.9%); all other majors were mentioned by fewer than five participants (total: 58.1%). The high proportion of female students in the sample reflects the ratio of male to female students in psychology and the social sciences in German-speaking countries.

Procedure

The method of choice to collect subjective states in real time and avoid retrospective biases is the use of electronic diaries to assess self-reported thoughts, emotions, and behaviors while the participant carries out daily activities (Ebner-Priemer & Trull, 2009). In this study, we used a combination of a time-based and event-based sampling strategy (see Shiffman, 2007, for an overview of different strategies). The study consisted of 16 measurement occasions and started with a baseline questionnaire. In this questionnaire, participants responded to basic demographic questions, filled out an adapted version of the Pure Procrastination Scale (Krause & Freund, 2014a; Steel, 2010a), which measures trait procrastination, and the Academic Procrastination State Inventory (Schouwenburg, 1995; German translation by Helmke & Schrader, 2000). In addition, participants rated 22 categories of activities derived from a comprehensive pretest with an independent sample (e.g., sports, eating, and chores) on the dimensions under investigation in this study (e.g., importance).

Participants were asked to indicate the likelihood of writing their theses for every day of the week by allocating a total of 100 points to one or different days of the week. Based on these likelihood ratings, participants chose the day on which they were most likely to work on the thesis and indicated a time window in which they planned to do so. Because of the possibility that people want to change their plans or have to do so due to external circumstances, we allowed participants to change their individual time windows as often as they wanted over the course of the study. However, they were asked to let us know about their desired change in plans at least one day in advance to avoid short-term changes in plans characteristic for procrastination.

Participants indicated the date on which they intended to submit their theses. This allowed us to determine the start of the weekly assessment period for every participant, that is,

14 weeks before the indicated date of submission. Participants received a questionnaire once a week on the indicated "writing day" in the middle of the indicated time window followed by an SMS prompt. Participants were asked to fill out the questionnaire on their smartphone or computer as soon as possible and no later than 90 min after the SMS prompt. In this questionnaire, participants indicated what they were currently doing. When they responded that they were working on the thesis, they were asked to rate this activity on various dimensions (e.g., importance). When they responded that they were not working on the thesis, which we defined as a procrastination episode, they were asked to list the alternative activity and rate the activity as well as the intended activity of working on the bachelor's thesis on the same dimensions. Finally, participants rated their mood, the subjective distance to the deadline of the thesis submission, what they intended to do after finishing the questionnaire and for how long. Additionally, they evaluated their progress in the past week on various dimensions not relevant for this paper. After submission of their theses, participants completed the final questionnaire (also not relevant for this paper).

Participants who responded to all questionnaires in time were reimbursed with 40 Swiss francs or euros. Participants who missed questionnaires were reimbursed proportionally (M = 27.60 Swiss francs).

Response rate and data handling. This study was part of a longitudinal project on procrastination. Data were gathered from procrastination and non-procrastination episodes (i.e., when students were writing their theses). For this article, we only considered data from procrastination episodes (n = 643).

All 105 participants filled out the baseline questionnaire. Overall, we sent out a total of n = 1,203 weekly questionnaires, n = 812 of which were completed in time (i.e., within 90

minutes), n = 120 too late, and 271 not at all. This response rate can be considered normal for an experience sampling study (Pychyl et al., 2000). Results did not change substantially when including questionnaires in the analyses that were filled out too late. Therefore, we used all available data to increase statistical power and, thereby, the reliability of the results without biasing them. The average response time was M = 19.36 min (SD = 36.39).

To maximize the number of participants in the study, we also included participants whose submission date was less than 14 weeks away. This led to a larger number of completed questionnaires in the second half of the study (n = 541) in comparison to the first half (n = 391). The smallest number of questionnaires (n = 34) was completed at the first of the 14 weekly measurement occasions. The largest number of questionnaires (n = 82) was filled out at the 12th measurement occasion. For each measurement occasion, an average of n = 66.57 of the sample filled out the questionnaire. Considering only the data from procrastination episodes (n = 643), n = 547 questionnaires were filled out in time, and n = 96 too late. There were more questionnaires from the second than the first half of the study (n = 381 vs. 262). Because we had more observations from the second (vs. first) half of the study, we also separately analyzed the data for both halves. None of the main effects were conflicting (i.e., pointing in opposite directions). However, slightly more effects reached significance in the second half (n = 56 vs. 45), reflecting the larger number of observations in the second half of the study. On average, 45.93 students procrastinated at any given measurement occasion.

Fifteen participants submitted their theses before the deadline. Hence, we restructured the data of these participants according to the actual submission date. Neither trait procrastination, β = -.03, $t(103)$ = -0.33, p = .74, nor state procrastination, β = -.18, $t(103)$ = -1.80, p = .07, predicted the number of completed questionnaires. Due to the small number of dropouts, we

were unable to test for selective attrition. Moreover, neither trait procrastination, $\beta = .12$, $t(103) = 1.27$, $p = .21$, nor state procrastination, $\beta = -.07$, $t(103) = -0.68$, $p = .50$, measured at baseline predicted the number of writing sessions.

Measures

Activity characteristics and goal focus. Baseline pleasantness (i.e., "How pleasant is this activity for you?") and importance (i.e., "How important is this activity for you in general?") of activities were assessed in the baseline questionnaire. The response scale ranged from 1 (*very unpleasant/very unimportant*) to 7 (*very pleasant/very important*).

During procrastination episodes, activity characteristics and goal focus were assessed as they related to the current activity. First, participants were prompted to indicate what they were currently doing, which they then rated on the following six dimensions: pleasantness (i.e., “How pleasant is this activity?”), importance, stressfulness, guilt, delay of gratification (i.e., “Is this activity immediately rewarding or will it pay off later in time [in hours, weeks, days, or months]?”), and the motivation to engage in this activity (a list of all measures used in this study is provided in Appendix B). In addition, but not included in this analysis, participants also rated their current activity in terms of the guilt they might feel had they not engaged in it, facilitation with regard to the thesis, conflict with regard to the thesis, difficulty, and urgency. For the dimension delay of gratification the response scale ranged from 1 (*immediately rewarding*) to 7 (*rewarding later*). All other ratings used a 7-point rating scale ranging from 1 (*not at all*) to 7 (*very much*). Participants used the same scale to rate their outcome focus (i.e., “To what extent are you focusing on what you want to achieve with this activity?”) and process focus (i.e., “To what extent are you focusing on the activity itself?”). Students also rated the bachelor’s thesis on the same dimensions (excluding the items for facilitation and conflict).

Statistical Analyses

Between- and within-person analyses. All intraclass correlation coefficients were higher than .05, requiring multilevel analyses (Bliese, 2009). Overall, 14 multilevel analyses were conducted. Multilevel models can handle missing data and therefore maximize the utility of existing data (Kenny, Kashy, & Cook, 2006).

As both predictors, process and outcome focus, varied within as well as between persons, we followed the procedure recommended by Bolger and Laurenceau (2013) to partition the variables into their constituent within-subjects (within process focus/within outcome focus) and between-subjects (between process focus/between outcome focus) components. This partition yielded a total of four variables, two (Level 2) between-persons variables and two (Level 1) person-centered variables that varied at each measurement occasion. Level 2 variables represent the score of participants relative to the sample. Level 1 variables represent the scores of participants with respect to their own mean across all measurement occasions. We also considered possible interactions between the two foci at both levels of analysis (i.e., within- and between-subjects interaction). Although we were not interested in time trends in this paper, we followed the recommendation of Bolger and Laurenceau (2013) and included the centered week number as a fixed effect in the model to control for potential effects of time. The analyses allowed random intercepts and random slopes. To account for within-person variability in goal focus, we included random effects for both goal foci only at the within-person level to reduce the number of random effects to be estimated.

Multilevel analyses were conducted with R (Version 3.3.1; R Development Core Team, 2016), using the nlme and lme4 packages (Bates et al., 2016; Pinheiro et al., 2016). We calculated a likelihood-ratio based adjusted pseudo R^2 for each model as implemented in the

MuMIn package (Bartoń, 2016). This statistic offers the proportion of the variance explained by comparing models including the explanatory variables with models without them.

Calculation of dependent variables. To construct the dependent variable for changes in importance and pleasantness during procrastination episodes as compared with *baseline*, the indicated alternative activities were coded by two independent raters (Cohen's $\kappa = .94$) into the 22 categories of activities the students had already rated at baseline. We then subtracted the individual baseline value for an activity from the individual value indicated during a procrastination episode. A positive (vs. negative) value indicated that the person perceived the alternative activity as, for example, more (vs. less) pleasant during a procrastination episode when compared with baseline. The analyses were based on all difference scores on a dimension over all activities. This allowed us to test whether alternative activities, in general, were perceived differently during procrastination episodes as compared with baseline, and to test whether these differences could be predicted by goal focus.

To construct the dependent variable for the evaluation of alternative activities (e.g., watching TV) relative to the *focal activity* (i.e., bachelor's thesis) during procrastination episodes, we subtracted the rating of the bachelor's thesis from the rating of the alternative activity. A positive (vs. negative) value indicated that the person perceived the alternative activity as, for example, more (vs. less) important than the bachelor's thesis in a particular procrastination episode. The analyses were again based on all difference scores on a dimension over all activities. This allowed us to test whether, during procrastination episodes, alternative activities, in general, were perceived differently than the bachelor's thesis, and whether these differences could be predicted by goal focus.

Results

Preliminary Analyses

At the time of prompting, participants were asked to indicate their current activity. They indicated that they were working on their bachelor's theses in a total of 289 instances (31%), and that they did something else in a total of 644 instances (69%). This procrastination rate is substantially higher than the rate (i.e., 36%) obtained in the experience sampling study of Pychyl et al. (2000), and may be explained by the fact that we did not prompt participants randomly throughout the day but at a predetermined critical time. Most of the alternative activities fell into the category of studying (i.e., university-related activities not related to the bachelor's thesis; n = 148), eating/cooking (n = 110), multimedia (n = 54), nonacademic work (n = 50), sleeping/relaxing (n = 40), shopping (n = 33), sports, and chores (both n = 22). All other categories were mentioned fewer than 20 times.

Inspection of subject-by-subject scatterplots indicated that three participants had reported two or fewer instances of procrastination over the 14 weeks. Their data could not be used for the estimation of within-subject changes. Additionally, in the subset of observations from procrastination episodes, one data point was identified as an outlier and excluded from the analyses.

In order to get an impression of the variability of goal focus, we calculated individual means for each participant for goal focus during procrastination episodes and non-procrastination episodes; process focus during procrastination episodes did not correlate significantly with process focus during non-procrastination episodes, $r = .13$, $p = .24$. Regarding outcome focus, there was a positive correlation, $r = .36$, $p < .001$. Together with substantial mean intraindividual standard deviations for process and outcome focus during procrastination episodes (process

focus: $M = 1.67$; outcome focus: $M = 2.01$), these findings indicate that goal focus is dynamic and changes within persons.

Outcome and process focus correlated significantly, $r = .28$, $p < .001$ during procrastination episodes; this was the case at the within-, $r = .26$, $p < .001$ and between-person level, $r = .30$, $p = .002$. That is, on days on which participants focused more on the outcome of alternative activities, they also tended to focus more on the process (i.e., within-person correlation). Participants with a higher average outcome focus tended to have a higher average process focus (i.e., between-person correlation). Bivariate correlations between goal focus and characteristics of alternative activities are displayed in Table 7.

Table 7
Bivariate Correlations Between Goal Focus and Characteristics of Alternative Activities During Procrastination Episodes (Pearson Product Moment Correlation)

	Within[a]		Between[b]	
Dimension	Outcome focus	Process focus	Outcome focus	Process focus
Importance	.42***	.15**	.25*†	.15
Pleasantness	-.38***	.06	-.44***	.08
Guilt	-.39***	-.18***	-.19	-.02
Stress	.44***	.13**	.39***	.18
Motivation	-.15**	.23***	-.24*†	.20*†
Delay of gratification	.47***	.12**	.56***	.06

Note. [a] Within-person correlations represent correlations (averaged across participants) between a person's time-specific deviations on two variables.
[b] Between-person correlations represent correlations between individual means on two variables.
† Association did not remain significant after Bonferroni correction for multiple testing.
*$p < .05$. **$p < .01$. ***$p < .001$.

Bivariate correlations between characteristics of alternative activities and descriptive statistics are displayed in Table 8. Trait and state procrastination measured at baseline correlated positively with the average guilt reported during procrastination episodes (trait: $r = .37$, $p < .001$;

state: $r = .42$, $p < .001$). Moreover, students scoring higher on state procrastination evaluated the alternative activities during procrastinating episodes as less important, $r = -.36$, $p < .001$.

Table 8
Bivariate Correlations Between Characteristics of Alternative Activities as Well as Descriptive Statistics

Dimension	1	2	3	4	5	6
1. Importance	-					
2. Pleasantness	-.07	-				
3. Guilt	-.56***	.14***	-			
4. Stress	.19***	-.64***	-.10*	-		
5. Motivation	.14***	.70***	-.07	-.42***	-	
6. Delay of gratification	.22***	-.49***	-.23***	.51***	-.31***	-
M	5.51	5.09	2.35	2.85	5.02	3.07
SD	1.70	1.82	1.74	1.95	1.69	2.15

Note. $N = 643$ observations.
*$p < .05$. ***$p < .001$.

Prediction of Activity Evaluations

In the following, we describe the significant results for each dimension regarding goal focus as a predictor of different activity characteristics (i.e., absolute, relative to baseline, and relative to the focal activity). Overall, we observed slightly stronger and/or more associations at the within-person (vs. between-person) level. Due to space constraints, we focus on the within-person effects with the exception of importance, for which we also describe the significant between-person effects to exemplify their interpretation. All nonsignificant effects and the remaining between-person effects can be found in the corresponding tables. There were no or small time effects in most of the analyses. Because time effects are not the focus of this paper, we do not address them in the descriptions below.

Importance. We predicted that both outcome and process focus are positively associated with importance. The multilevel analysis with *absolute* importance as dependent variable and goal focus at the between and within-person levels as independent variables revealed significant

main effects for outcome focus at both levels (Table 9). Specifically, students who focused more on the outcome reported alternative activities as more important (between-person effect), and students reported alternative activities to be more important on days on which they focused more on the outcome (within-person effect). This effect of outcome focus was even slightly more pronounced on days when students also focused more on the process (within-person interaction).

The multilevel analysis regarding activity ratings *relative to baseline* revealed that students who focused more on the outcome reported alternative activities as more important than at baseline (between-person effect), and students reported alternative activities as more important than at baseline on days when they focused more on the outcome (within-person effect; see Table 9). Similarly, the multilevel analysis investigating how students evaluated the importance of the alternative activities *relative to the focal activity* (see Table 9) revealed a significant negative intercept, indicating that students with an average outcome and process focus on a typical day in the middle of the study perceived the bachelor's thesis as more important than the alternative activities. However, on days when students focused more on the outcome of the alternative activities in which they were currently engaged, they perceived them as equally important as the bachelor's thesis (within-person effect). The effect of outcome focus was more pronounced on days on which they also focused more on the process (within-person interaction). Students who, on average, focused more on the process also reported the alternative activities to be nearly as important as the bachelor's thesis (between-person effect).

Table 9
Parameter Estimates for Multilevel Model of Importance as a Function of Goal Focus

	Absolute					Relative to baseline					Relative to focal activity				
				CI_{95}					CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	5.45*	0.09	62.58	5.27	5.62	-0.15	0.11	-1.40	-0.36	0.07	-0.88*	0.12	-7.45	-1.11	-0.66
Time	-0.01	0.01	-0.42	-0.04	0.03	-0.01	0.02	-0.46	-0.04	0.03	0.01	0.02	0.41	-0.03	0.05
Within PF	0.08	0.05	1.66	-0.02	0.18	0.001	0.05	0.03	-0.10	0.10	0.03	0.06	0.47	-0.09	0.16
Within OF	0.30*	0.04	7.08	0.21	0.38	0.26*	0.05	5.40	0.16	0.36	0.33*	0.05	6.48	0.23	0.43
Within PF x OF	0.04*	0.02	2.39	0.01	0.08	0.02	0.02	1.06	-0.02	0.07	0.06*	0.02	2.79	0.02	0.10
Between PF	0.08	0.07	1.15	-0.06	0.23	-0.11	0.10	-1.19	-0.30	0.08	0.21*	0.10	2.12	0.02	0.39
Between OF	0.16*	0.06	2.57	0.04	0.29	0.16*	0.08	1.97	0.01	0.34	0.03	0.09	0.29	-0.15	0.20
Between PF x OF	0.02	0.05	0.40	-0.09	0.12	-0.04	0.06	-0.65	-0.17	0.08	0.03	0.07	0.46	-0.11	0.17
				CI_{95}					CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2[a]															
Intercept	0.35	0.59		0.44	0.75	0.63	0.79		0.59	0.99	0.69	0.83		0.63	1.05
Within PF	0.07	0.26		0.16	0.36	0.04	0.20		0.06	0.34	0.11	0.34		0.18	0.48
Within OF	0.07	0.26		0.17	0.35	0.07	0.27		0.16	0.37	0.08	0.28		0.19	0.40
Level 1[a]															
Residual	1.82	1.35		1.24	1.42	2.16	1.47		1.35	1.57	2.66	1.63		1.51	1.73
Pseudo R^2 [b]	0.22					0.13					0.17				

Note. N = 102 persons, 14 weeks, 643 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus.

[a] Random effects represent within-person effects.

[b] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.

* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1000 simulations; normal approximation).

Pleasantness. Consistent with our hypotheses and as depicted in Table 10, students reported alternative activities as less pleasant on days on which they focused more on the outcome, and more pleasant when they focused more on the process (absolute scores). When comparing students' ratings of alternative activities to their baseline ratings of the same activities, the analysis revealed a significant intercept, indicating that participants with an average outcome and process focus on a typical day perceived the same activities as less pleasant when they were procrastinating compared with baseline (see Table 10). In line with our hypothesis, a higher outcome focus was associated with an even more pronounced difference. In contrast, the difference was lower with a higher process focus. That is, on days, on which participants focused particularly on the process, they perceived the alternative activity as equally pleasant as they generally do. In regard to the evaluation of alternative activities relative to the focal activity (see Table 10), there was a significant positive intercept, indicating that students with an average outcome and process focus on a typical day perceived the alternative activities as more pleasant than working on the bachelor's thesis. Confirming our hypotheses, this difference was more pronounced on days when students focused more on the process of the alternative activities in which they were currently engaged. In contrast, focusing more on the outcome made students perceive these activities as nearly as aversive as working on the bachelor's thesis.

Guilt. Supporting our hypotheses, the results presented in Table 11 show that participants reported less guilt on days on which they focused more on the outcome. A weaker but still significant effect was found for process focus (absolute scores). In addition, the analysis regarding activity evaluations relative to the focal activity revealed a significant positive

Table 10
Parameter Estimates for Multilevel Model of Pleasantness as a Function of Goal Focus

	Absolute					Relative to baseline					Relative to focal activity				
				CI_{95}					CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	5.02*	0.09	55.18	4.84	5.20	-0.31*	0.08	-3.98	-0.47	-0.15	1.17*	0.14	8.26	0.90	1.48
Time	0.03	0.02	1.87	-0.003	0.06	0.01	0.02	0.37	-0.02	0.04	0.04*	0.02	2.05	0.0003	0.08
Within PF	0.17*	0.05	3.49	0.07	0.28	0.12*	0.04	2.66	0.03	0.20	0.14*	0.05	2.69	0.03	0.23
Within OF	-0.34*	0.04	-8.95	-0.42	-0.27	-0.10*	0.03	-2.94	-0.17	-0.03	-0.34*	0.05	-6.53	-0.43	-0.23
Within PF x OF	0.01	0.02	0.45	-0.03	0.05	0.03	0.02	1.79	-0.01	0.07	0.003	0.02	0.16	-0.04	0.05
Between PF	0.30*	0.08	3.66	0.13	0.45	0.06	0.07	0.92	-0.07	0.21	0.15	0.13	1.19	-0.11	0.38
Between OF	-0.37*	0.07	-5.26	-0.51	-0.23	-0.09	0.06	-1.52	-0.21	0.02	-0.58*	0.11	-5.22	-0.82	-0.35
Between PF x OF	0.09	0.05	1.62	-0.02	0.19	0.09	0.05	2.00	-0.003	0.19	0.16	0.09	1.84	-0.01	0.32
				CI_{95}					CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2 [a]															
Intercept	0.36	0.60		0.43	0.77	0.16	0.40		0.22	0.58	1.16	1.08		0.86	1.31
Within PF	0.07	0.26		0.14	0.38	0.02	0.16		0.06	0.28	0.01	0.12		0.02	0.28
Within OF	0.03	0.18		0.06	0.27	0.01	0.08		0.02	0.20	0.07	0.27		0.14	0.39
Level 1 [a]															
Residual	2.04	1.43		1.33	1.51	2.01	1.42		1.30	1.49	2.92	1.71		1.58	1.82
Pseudo R^2 [b]	0.22					0.05					0.16				

Note. N = 102 persons, 14 weeks, 643 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus.

[a] Random effects represent within-person effects.

[b] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.

* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1000 simulations; normal approximation).

intercept, indicating that students with an average outcome and process focus on a typical day perceived the alternative activities as more guilt-inducing than the focal activity (see Table 11). However, this difference disappeared (i.e., moderately high outcome focus) and the effect even reversed (i.e., high outcome focus) on days when students focused more on the outcome of the alternative activities. That is, when students focused much more on the outcome than they did on average, they reported the alternative activities to cause less guilt than they associated with the focal activity.

Table 11
Parameter Estimates for Multilevel Model of Guilt as a Function of Goal Focus

	Absolute					Relative to focal activity				
				CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	2.49*	0.10	24.37	2.27	2.68	0.50*	0.14	3.51	0.22	0.78
Time	-0.04*	0.01	-2.84	-0.07	-0.01	-0.06*	0.02	-2.62	-0.10	-0.01
Within PF	-0.09*	0.04	-2.36	-0.16	-0.01	-0.09	0.05	-1.86	-0.20	0.01
Within OF	-0.27*	0.03	-7.68	-0.34	-0.20	-0.30*	0.04	-7.07	-0.39	-0.21
Within PF x OF	0.01	0.02	0.85	-0.02	0.05	-0.003	0.02	-0.12	-0.05	0.04
Between PF	-0.05	0.08	-0.55	-0.20	0.12	-0.14	0.13	-1.13	-0.41	0.09
Between OF	-0.10	0.08	-1.36	-0.25	0.05	-0.15	0.11	-1.37	-0.37	0.06
Between PF x OF	-0.12*	0.06	-2.07	-0.23	-0.001	-0.09	0.09	-1.00	-0.26	0.09
				CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2[a]										
Intercept	0.58	0.76		0.59	0.94	1.11	1.05		0.83	1.33
Within PF	0.005	0.07		0.01	0.20	0.01	0.10		0.02	0.27
Within OF	0.03	0.16		0.09	0.24	0.01	0.08		0.02	0.24
Level 1[a]										
Residual	1.97	1.40		1.30	1.47	3.38	1.84		1.70	1.93
Pseudo R^2[b]	0.19					0.13				

Note. N = 102 persons, 14 weeks, 643 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus.
[a] Random effects represent within-person effects.
[b] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.
* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1000 simulations; normal approximation).

Stress. Confirming our hypothesis regarding the association between outcome focus and stress, we found that students reported alternative activities to be more stressful on days when they focused more on the outcome (absolute scores are presented in Table 12). Table 12 shows similar results regarding activity ratings relative to the focal activity. The significant negative intercept indicates that students with an average outcome and process focus on a typical day perceived the alternative activities as less stressful than the focal activity. However, this difference decreased on days when students focused more on the outcome of the alternative activities.

Table 12
Parameter Estimates for Multilevel Model of Stress as a Function of Goal Focus

	Absolute					Relative to focal activity				
				CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	2.92*	0.10	30.31	2.73	3.11	-2.08*	0.15	-13.96	-2.38	-1.80
Time	-0.02	0.02	-0.99	-0.05	0.02	-0.03	0.02	-1.12	-0.07	0.02
Within PF	0.03	0.05	0.51	-0.07	0.12	0.02	0.06	0.29	-0.10	0.13
Within OF	0.38*	0.04	9.78	0.30	0.46	0.44*	0.05	8.79	0.39	0.53
Within PF x OF	0.03	0.02	1.32	-0.01	0.06	0.03	0.02	1.17	-0.02	0.07
Between PF	-0.12	0.09	-1.35	-0.29	0.05	0.10	0.14	0.75	-0.17	0.40
Between OF	0.33*	0.07	4.50	0.19	0.48	0.27*	0.12	2.34	0.03	0.49
Between PF x OF	-0.15*	0.06	-2.66	-0.27	-0.04	-0.19*	0.09	-2.07	-0.37	-0.005
				CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2[a]										
Intercept	0.34	0.58		0.41	0.82	1.21	1.10		0.85	1.35
Within PF	0.06	0.25		0.15	0.40	0.04	0.20		0.03	0.36
Within OF	0.02	0.15		0.07	0.32	0.04	0.19		0.06	0.33
Level 1[a]										
Residual	2.42	1.55		1.45	1.67	3.59	1.90		1.75	2.01
Pseudo R^2 [b]	0.23					0.18				

Note. N = 102 persons, 14 weeks, 643 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus.
[a] Random effects represent within-person effects.
[b] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.
* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1000 simulations; normal approximation).

Part III

Motivation. We predicted a positive association between process focus and students' motivation to be engaged in alternative activities. With regard to the effects of outcome focus, we had two alternative hypotheses (i.e., we expected either a positive or negative association). The multilevel analysis revealed that students reported to be less motivated to engage in the alternative activities on days on which they focused more on the outcome, but more motivated when they focused more on the process (see absolute scores in Table 13). The significant interaction at the within-person level indicates that the motivational effect of a higher process focus was stronger on days, on which students also focused more on the outcome. The analysis

Table 13
Parameter Estimates for Multilevel Model of Motivation as a Function of Goal Focus

	Absolute					Relative to focal activity				
				CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	4.94*	0.08	60.13	4.78	5.10	0.71*	0.15	4.58	0.42	1.00
Time	0.02	0.02	1.22	-0.01	0.05	0.07*	0.02	3.29	0.03	0.11
Within PF	0.27*	0.05	5.81	0.18	0.37	0.29*	0.06	5.06	0.18	0.41
Within OF	-0.19*	0.04	-5.38	-0.26	-0.12	-0.23*	0.05	-4.74	-0.33	-0.14
Within PF x OF	0.04*	0.02	2.19	0.004	0.07	0.02	0.02	0.96	-0.02	0.06
Between PF	0.30*	0.07	4.04	0.15	0.45	0.39*	0.14	2.81	0.09	0.70
Between OF	-0.23*	0.06	-3.62	-0.37	-0.11	-0.53*	0.12	-4.31	-0.77	-0.28
Between PF x OF	0.08	0.05	1.64	-0.01	0.19	0.28*	0.09	3.04	0.11	0.47
				CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2 [a]										
Intercept	0.23	0.48		0.29	0.65	1.45	1.20		0.95	1.44
Within PF	0.05	0.23		0.11	0.34	0.06	0.24		0.07	0.39
Within OF	0.02	0.13		0.03	0.23	0.05	0.22		0.07	0.34
Level 1 [a]										
Residual	2.06	1.43		1.32	1.53	3.08	1.76		1.62	1.88
Pseudo R^2 [b]	0.14					0.14				

Note. N = 102 persons, 14 weeks, 643 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus.
[a] Random effects represent within-person effects.
[b] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.
* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1000 simulations; normal approximation).

comparing ratings of alternative activities to the focal activity revealed similar results. The significant positive intercept in Table 13 indicates that students with an average outcome and process focus on a typical day were more motivated to engage in alternative activities than in the focal activity. This difference increased on days on which students focused more on the process, and decreased on days on which they focused more on the outcome of the alternative activities.

Delay of gratification. In line with our hypotheses, students reported alternative activities to have a delayed reward on days on which they focused more on the outcome (see absolute scores in Table 14). Furthermore, the analysis regarding the evaluation of alternative

Table 14
Parameter Estimates for Multilevel Model of Delay of Gratification as a Function of Goal Focus

	Absolute					Relative to focal activity				
				CI_{95}					CI_{95}	
Fixed effects	*B*	*SE*	*t*	Lower	Upper	*B*	*SE*	*t*	Lower	Upper
Intercept	3.16*	0.10	30.48	2.97	3.37	-2.11*	0.16	-12.88	-2.42	-1.79
Time	-0.05*	0.02	-2.84	-0.09	-0.02	-0.01	0.02	-0.53	-0.06	0.03
Within PF	-0.01	0.06	-0.15	-0.12	0.10	-0.04	0.07	-0.55	-0.17	0.10
Within OF	0.45*	0.04	10.70	0.37	0.54	0.47*	0.05	8.74	0.35	0.57
Within PF x OF	0.02	0.02	0.92	-0.02	0.06	0.01	0.03	0.38	-0.04	0.06
Between PF	-0.20*	0.09	-2.15	-0.38	-0.02	-0.25	0.15	-1.70	-0.53	0.06
Between OF	0.50*	0.08	6.29	0.34	0.67	0.52*	0.13	4.07	0.26	0.76
Between PF x OF	-0.08	0.06	-1.24	-0.20	0.04	-0.25*	0.10	-2.51	-0.44	-0.06
				CI_{95}					CI_{95}	
Random effects	Variance	*SD*		Lower	Upper	Variance	*SD*		Lower	Upper
Level 2[a]										
Intercept	0.45	0.67		0.48	0.87	1.60	1.27		1.00	1.54
Within PF	0.09	0.29		0.14	0.42	0.10	0.32		0.13	0.47
Within OF	0.03	0.17		0.04	0.27	0.05	0.22		0.07	0.35
Level 1[a]										
Residual	2.76	1.66		1.54	1.77	3.64	1.91		1.77	2.03
Pseudo R^2 [b]	0.27					0.21				

Note. N = 102 persons, 14 weeks, 643 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus. High values on the dependent variable indicate perceived later (vs. immediate) reward.
[a] Random effects represent within-person effects.
[b] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016) represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.
* 95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1000 simulations; normal approximation).

activities relative to the focal activity revealed a significant intercept. The negative intercept in Table 14 indicates that, on average, students on a typical day perceived the alternative activities as more immediately rewarding than the bachelor's thesis. However, on days, on which students focused more on the outcome, the difference between alternative and focal activity decreased.

Discussion

Past research on procrastination has focused on characteristics of the focal goal and neglected the question of what people do and how they perceive the activities in which they engage instead. This was the focus of the current study. The current study shows that students who procrastinate often engage in alternative activities they deem important or pleasant at the time. We hypothesized and found that the evaluation of the activities in which people engage while procrastinating is modulated by goal focus. Overall, focusing on the outcome of alternative activities was more strongly related to the perception of alternative activities than adopting a process focus. The stronger effect of outcome compared with process focus might be due to an increased awareness that one procrastinates. In line with this assumption, we found that people perceive alternative activities as less pleasant, more stressful, and less immediately rewarding when they focus more on the outcome. In addition, the increased awareness of one's procrastination might intensify attempts to justify procrastination. Consistent with this assumption, we found that an increase in outcome focus was associated with an increase of the importance of alternative activities and lower feelings of guilt. Additionally, students were less motivated to engage in alternative activities when they focused more on the outcome.

We assumed that increases in process focus should allow students to better block out that they are procrastinating and thus be more "absorbed" in the activity (Sirois, 2014a, p. 30). In line with this assumption, process focus was positively associated with pleasantness and motivation,

and negatively with guilt. For both foci, results largely converged at both the within- and the between-subjects level, and were consistent across absolute and relative to baseline evaluations.

Comparing the perception of alternative activities relative to the focal activity (working on the bachelor's thesis), students with a higher outcome focus perceived alternative activities as equally important as the bachelor's thesis, less guilt-evoking, and almost as stressful as the thesis. They still reported the bachelor's thesis to be associated with a more delayed reward than the alternative activity but, with a higher outcome focus, the difference decreased. This set of results might explain the impaired motivation that we observed when outcome focus was high. In contrast, when students focused more on the process, they perceived the alternative activities as more pleasant and were more motivated to engage in the alternatives.

There was a weak positive correlation between outcome and process focus. There were only a few weak interactions between the two foci on most dimensions considered in this study. Moreover, the effects of our predictors had the same direction for some characteristics (e.g., guilt) but opposite directions for others (e.g., pleasantness). Thus, it seems that process and outcome focus largely exert distinct influences on how students perceive activities. Given that time trends in this study were weak or mostly nonexistent, changes in goal focus seem better suited to predict the dynamic changes in activity evaluations than a time-dependent process.

Toward a Dynamic Understanding of Procrastination

Procrastination can only be fully understood when considering how people perceive the alternative activities in which they engage while procrastinating. Qualifying the common assumption that students procrastinate with activities that are pleasant, we found that activities that are "normally" seen as pleasant may become less pleasant during procrastination episodes (i.e., "spoiled pleasure", Hofmann et al., 2013). Such changes can only be captured by moment-

to-moment assessments of activity characteristics. In addition, we observed slightly stronger and/or more associations at the within-person (vs. between-person) level, suggesting that the pervasive approach to investigate between-person differences is limited in improving our understanding of procrastination.

The main aim of this study was to investigate how goal focus is linked to activity characteristics and affect while people are procrastinating. However, perceiving activities differently and feeling differently likely has important implications for further goal striving. One possible implication of the results of this study is that a higher outcome focus may be more adaptive than a higher process focus. This might be due to the changes in perceived pleasantness: the perceived pleasantness of activities decreased with a higher outcome focus, but increased with a higher process focus. The decreased pleasantness might make it easier to disengage from alternative activities and serve as a stop signal to procrastination. This is in line with the conceptualization of procrastination as a short-term emotion regulation strategy (Pychyl & Sirois, 2016). If the alternative activity does not help to repair the mood, people might be more likely to abandon it and engage in the focal activity. However, alternatively, they might disengage from the alternative activity and engage in yet another alternative activity, and thus keep procrastinating. In some cases, a higher outcome focus may also be less adaptive because it may be easier to justify one's procrastination when feeling bad (i.e., when perceiving the alternatives as less pleasant), which, in turn, might sustain procrastination.

Unexpected Findings

There was only a weak negative association between process focus and guilt at the absolute level, and no association when considering evaluations relative to the focal activity. Theoretical approaches link procrastination to guilt (e.g., Blunt & Pychyl, 2005) and have found

empirical support (e.g., Pychyl et al., 2000). However, recent research indicates that shame may play a more significant role than guilt in procrastination (Giguère et al., 2016). The current study did not include shame, so we could not explore whether process focus is associated with shame rather than guilt. However, we found moderate positive relationships between self-reported procrastination at the beginning of the study and reported guilt during procrastination episodes. Based on this finding, it would be interesting to investigate why this is the case. For instance, are low trait procrastinators "better" at temporarily rationalizing their procrastination (e.g., "self-indulgent reconstruals," Anderson, 2016, p. 51)?

Another unexpected finding was that process focus was associated with importance only in the form of a weak positive interaction with outcome focus at the within-person level. Freund and Hennecke (2012) have speculated that people focus on both the process and outcome of goal pursuit if a goal is subjectively very important (which is why there is also a positive correlation between process and outcome focus). In most cases, the alternative activity is less important than the focal activity although, as the current study has shown, people may evaluate the alternative activity temporarily as more important during procrastination episodes. Hence, outcome focus may be sufficient to explain increases in importance for alternative activities, and process focus may only explain unique variance in *very* important activities.

Limitations and Further Directions

Despite the promising results of this attempt at understanding the dynamics of procrastination, we acknowledge the limitations of this study. Although goal focus explained a substantial amount of variance, the unexplained residual variance also highlights that we have identified but one out of a range of possible factors related to the perception of activities during procrastination episodes. Similarly, we observed some heterogeneity in magnitude and direction

of the investigated associations. This is an encouraging finding for exploring potential moderators impacting these relationships such as type of activity. In this study, we were interested in the relationships at an aggregated level and did not have enough observations to analyze the data at an activity level. Based on the findings of this research, future studies may focus only on one particular alternative activity (e.g., social media) or a subset of activities (e.g., very pleasant alternatives). On the one hand, a focus on one particular alternative activity would allow for a more systematic comparison between different individuals. Additionally, having multiple measurement occasions in different goal phases would, for example, provide insights into the role of process and outcome focus for goal choice (e.g., "Should I work out now instead of working on my thesis?") versus goal striving (e.g., "Now that I am working out, how long should I keep going?"; see Steel & Weinhardt, 2017). On the other hand, a focus on one particular alternative activity may come at the price of limited generalizability to other activities.

The data were collected using self-report questionnaires, which lends the results subject to common method bias, may have increased metacognitive awareness, or operated as a kind of intervention by directing students' awareness to their procrastination behavior (e.g., Schmitz & Wiese, 2006). Furthermore, we used single items to assess the constructs because we did not want to burden the participants with too many items asking them to respond to weekly questionnaires over the period of 14 weeks, but this limits the reliability of the measures. Less demanding studies may use multiple indicators.

Further studies using an experimental design are needed because the current study is correlational. As such, we cannot rule out the possibility of an unmeasured time-varying third variable, and we cannot establish causality. This paper focused on one direction of possible causation (i.e., effects of goal focus on activity perceptions). Conversely, activity characteristics

may influence goal focus. For example, a process focus may create engagement but also reflect that people are deeply engaged in an activity. To draw stronger causal conclusions, future experiments may confront people with a temptation and assess their perception of the temptation as well as their goal focus. In a second exposure to the same temptation, the researchers could manipulate goal focus. Will participants with a stronger outcome focus perceive the temptation differently than participants with a stronger process focus? Conversely, manipulating task characteristics (e.g., describing the same alternative activity as more or less pleasant) and assessing subsequent goal focus would shed light on the effects of activity characteristics on goal focus. However, although such experimental approaches are necessary to determine cause and effect of relationships, they likely lack the ecological validity of experience sampling methods.

Lastly, one might ask whether we actually measured procrastination. Delay does not equal procrastination (Klingsieck, 2013). In some cases, short-term time adjustments of the target activity might have been necessary due to external circumstances (e.g., computer crash when wanting to work on the thesis). However, short of such incidents, voluntarily deciding not to engage in the intended and important focal activity but instead doing something else (that might seem gratifying or important at the time) fits the very definition of procrastination (see also the preference reversals described by Steel, 2007). We maintain that – although we might have incorrectly categorized a few incidents of true external obstructions of the targeted activity as procrastination – this would have increased error variance and, thereby, worked against finding any effects. Moreover, we believe that the current approach is an ecologically valid way of assessing procrastination while it takes place.

Although challenging, it would be of great significance to develop a method and criteria to distinguish between procrastination and justified shifts in priorities or strategic delay. General

criteria already exist (e.g., Klingsieck, 2013), and often it is simple to categorize a behavior as procrastination. However, sometimes there is a thin line between procrastination and strategic delay; a line which is blurred by "the complex awareness" (Anderson, 2016, p. 55) of the focal activity and procrastinators' avoidance of "the truth about what they are doing" (p. 51). In other words, how do we know whether a behavior should be categorized as procrastination when the self-deception of the procrastinator is so effective that he or she temporarily believes that his or her behavior is truly justified? Likely, it is necessary to integrate different values from different points in time (i.e., a priori perceptions of an activity, ratings while engaged in the activity, post hoc evaluation of one's behavior). However, more theory is needed to explain how these ratings should be integrated into an overall evaluation.

Conclusions

The current study constitutes an important step in understanding the dynamics of academic procrastination in students' lives by considering alternative activities during procrastination episodes. We view the design as a major strength of the study. While procrastination is often viewed as a relatively stable personality-like trait, Sirois and Pychyl (2016a, p. 259) have recently stressed the need to also "view procrastination as a situationally bound phenomena [*sic*]" and called for studies with a more temporal focus, such as experience sampling, "to better understand the processes underlying procrastination." The present study adhered to this call and assessed procrastination in an ecologically valid way in the natural environment of students. The study took into account interindividual variability in planned writing windows and sent the questionnaires at times when the students had planned and anticipated to be most likely engaged in writing their theses. The design of the study also allowed us to analyze the between- and within-person effects separately, providing further

insights into the dynamics of procrastination. Whereas previous research has largely focused on characteristics of the focal activity, we have focused on both perceptions of the focal and alternative activities, and how they are related to each other during procrastination episodes. The current study demonstrates that goal focus is a relevant construct to understand procrastination.

PART IV: "WHY AM I DOING THIS?" DEADLINES INCREASE OUTCOME FOCUS FOR FOCAL AND ALTERNATIVE ACTIVITIES

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Abstract

Targeting the temporal dynamic of procrastination, two longitudinal studies (Study 1: $N = 105$; Study 2: $N = 346$) investigated how goal focus (i.e., the focus on the process vs. outcome of goal pursuit) changes over time (Study 1: 14 weeks; Study 2: 8 weeks). In both studies, we distinguished between the goal focus of an intended activity (Study 1: working on a bachelor's thesis; Study 2: exercising) and alternative activities in which people engaged while procrastinating. As expected, outcome focus increased with an approaching endpoint for the intended activity in both non-procrastination and procrastination episodes. In contrast, and again as hypothesized, process focus on the intended activities remained stable when people pursued a goal that requires the coordination of different goal-relevant activities (Study 1), but decreased when the goal-directed activity was repetitive (Study 2). The results contribute to the understanding of the dynamic nature of goal focus and procrastination.

Part IV

Introduction

How does procrastination affect the perception of the activity in which people engage instead? Do people focus on the activity itself or the associated outcomes? How does this focus change over the course of long-term goal pursuits such as writing a bachelor's thesis or working out regularly? The current two longitudinal studies are the first to address these questions. To this end, we used a novel approach to assess procrastination in the everyday lives of students and adult exercisers.

Procrastination, the purposive delay of the initiation or completion of goal pursuit despite expecting to be worse off for the delay (Steel, 2007), is highly prevalent in academia and especially applies to writing tasks (Solomon & Rothblum, 1984). For instance, students may put off working on their theses because the writing is perceived as stressful, frustrating, or boring (Pychyl et al., 2000). Students are often given fairly loose deadlines that lie many weeks in the far-seeming future and the tasks are typically relatively ill-structured. Distance to a deadline and a lack of structure both contribute to procrastination (Ariely & Wertenbroch, 2002). Another activity that many people put off despite the best of intentions is exercising regularly (Sirois, 2007). Similar to academic writing, exercising can be boring, tedious, and sometimes a solitary experience. Therefore, and despite the awareness of potential benefits of regular physical activity, a large number of people have problems executing intended exercise behaviors (e.g., Bocksnick, 2004; King et al., 1997). The current studies tackle procrastination in both areas, writing an academic thesis and exercising regularly.

A growing body of research suggests that procrastination is not only a trait-like personal characteristic but instead a dynamic phenomenon that changes over time (e.g., Moon & Illingworth, 2005). In particular, an approaching deadline or an endpoint of goal pursuit seems to

be an important factor for procrastination (Ariely & Wertenbroch, 2002; Ferrari & Díaz-Morales, 2007).

Goal-Setting Theory and Temporal Construal Level

A prominent theory that attaches importance to deadlines is Goal-Setting Theory (Locke & Latham, 1990, 2002). Deadlines serve as a tool for time control and increase the motivational effect of goals. When more time than needed is available to complete a task, the work pace slows to fill the available time. In contrast, when a deadline approaches, people work faster and spend more effort to complete the task (Fried & Slowik, 2004). Furthermore, the theory posits that goals need to be specific and challenging to increase performance.

Specificity and temporal distance are also central constructs in Construal Level Theory (e.g., Liberman et al., 2007; Trope & Liberman, 2003). The theory suggests that people form more abstract (vs. concrete) representations, or higher (vs. lower) level construals, of temporally distal (vs. proximal) events. That is, the greater the temporal distance from a future event, the more likely people represent the event in terms of abstract features that convey the perceived essence of the events. Close events, in contrast, are represented in terms of concrete and more incidental details. Construal level may explain why people often procrastinate on tasks until a deadline is looming: Only then might they consider the specifics of a task, including the means required to complete it and the context in which it will take place (McCrea et al., 2008).

Another aspect of the cognitive representation of goals that has recently been proposed to affect goal pursuit and procrastination is goal focus (Krause & Freund, 2014b). Goal focus denotes the salience of the means (process focus; e.g., focusing on citing relevant references when writing a thesis, focusing on proper breathing when working out) or the consequences of goal pursuit (outcome focus; e.g., a good grade when writing a thesis, weight loss when working

out; Freund & Hennecke, 2015). Although Goal-Setting Theory differentiates between different levels of specificity of goals *as a whole* and Construal Level Theory links psychological distance to *general cognitive mind-sets* of a more high-level (i.e., abstract) vs. low-level (i.e., concrete) representation of events, neither of these approaches differentiates between the salience of means and ends *within a given goal*, and provides a theoretical background of how goal focus relates to procrastination and develops over the course of goal pursuit or when approaching a deadline.

Goal Focus and Procrastination

Building on Helmke and Schrader's (2000) process model of procrastination, Krause and Freund (2014b; see also Freund et al., 2012) presented a dynamic motivational framework centering on the role of goal focus for goal pursuit and procrastination, and suggested a shift from a higher salience of the process when a deadline is far away to a stronger outcome focus when the deadline is close. Specifically, relating goal focus to the phases in the Rubicon model by H. Heckhausen (1989), an outcome focus should be more likely and beneficial than a process focus during the pre-decisional phase when people deliberate about whether or not to pursue a certain goal. In contrast, a process focus should be more predominant and beneficial during the pre-actional phase as well as when people are attempting to overcome procrastination during the non-urgent actional phase (i.e., when a deadline is still far away). This is in line with Fishbach and Choi's (2012) findings that it is adaptive over the course of goal pursuit to move the attention away from the ends an activity serves (i.e., the outcome). In the "urgent phase" (i.e., when a deadline is close), focusing on the outcome should increase the importance of goal achievement and, thereby, decrease procrastination. Finally, during the post-actional phase, again, focusing on the outcome should be more likely and adaptive when reviewing the instrumentality of the means for future reference.

Theoretical accounts (Freund et al., 2012) have distinguished goal focus from related goal dimensions, such as intrinsic versus extrinsic motivation as proposed by Self-Determination Theory (SDT, Deci & Ryan, 2000). At first glance, adopting a process focus might seem similar to being intrinsically motivated and focusing on the outcome to being extrinsically motivated. However, different to SDT that assumes intrinsic motivation to emerge when goals and activities are related to the basic needs of autonomy, competence, and relatedness, a process focus may occur for extrinsic reasons, e.g., because attending to the means of goal pursuit is praised by others. Similarly, focusing on the outcome may occur for intrinsic reasons such as when the outcome is to increase competence when writing a bachelor's thesis. Although intrinsic and extrinsic motivation is also an important venue for investigating procrastination, this set of studies explores the change in goal focus regarding the targeted and the alternative activities over the course of goal pursuit. Specifically, the present studies investigated a section of the model proposed by Krause and Freund (2014b), namely the hypothesized shift from focusing more on the process to focusing more on the outcome during the actional phase of goal pursuit, taking into account the goal focus when people were engaged in the focal activity (i.e., when writing a bachelor's thesis in Study 1 or working out in Study 2). There was an endpoint for both focal activities. However, whereas the endpoint for the bachelor's thesis was fixed and the goal could not be pursued any further after this deadline, the endpoint for the workout was defined by a post-study fitness test, leaving it to the participants whether they keep exercising or not after this test. In addition, we investigated how the goal focus of alternative activities (e.g., cleaning, watching TV) evolves when people procrastinate on working on their bachelor's thesis or on working out. The underlying assumption was that the approaching endpoint for the focal activity

also affects the way people engage in alternative activities. That is, a closer endpoint for the focal activity requires a higher outcome focus on alternative activities to justify one's procrastination.

Changes in Goal Focus When Engaging in Focal Activities

A looming deadline might intensify the salience of the positive consequences of goal-directed behavior (or the negative consequences of missing the deadline), increase the likelihood to closely monitor the distance to the goal, and provide a clear comparison standard that people can use to pace their use of time and effort in order to achieve the desired outcome by the deadline (e.g., Ariely & Wertenbroch, 2002; J. Heckhausen, 1999; Krause & Freund, 2014b; Locke & Latham, 2002). Although not achieving one's goals in an amateur sports study usually has less serious consequences (e.g., feeling proud vs. disappointed) than failing a bachelor's thesis (e.g., starting a master's program vs. redoing the thesis), both focal activities had an endpoint in the present studies. We hypothesized that people focus more on the outcome over time when engaged in either activity (i.e., working on the thesis or working out).

In contrast to the development of outcome focus over time, we hypothesized differential trajectories of change for process focus for the two activities. Zimmerman and Kitsantas (1997, 1999) found that the adaptiveness of goal focus for the acquisition and mastery of skills depends on the learning phase. Specifically, they argued that people focus on the process of an activity until a skill is developed and the behavior automatized. Afterwards, they perform better when they shift their focus to the outcome of goal pursuit. For instance, when engaging in the same workout routine over time, people first need to focus their attention on the proper execution of a push-up. However, as soon as they have learned and routinized how to perform push-ups, a focus on the process is less essential and people can focus more on potential outcomes, such as the number of push-ups they are able to perform or how the push-ups will help to build muscle

strength. Therefore, we hypothesized that process focus decreases over time for the focal activity of working out. In contrast, writing a thesis necessitates the performance of different activities (e.g., finding relevant literature, creating an outline). Additionally, the bachelor's thesis usually is the first thesis a student writes, so that most undergraduate students have to acquire the necessary skills. Therefore, we expected that the degree of focusing on the process of goal pursuit remains stable at a high level over the course of writing a bachelor's thesis.

Changes in Goal Focus When Engaging in Alternative Activities

Thus far, we have addressed the potential changes over time in process and outcome focus regarding the intended activity. However, people often procrastinate pursuing the goal to write a thesis or to exercise regularly, and their focus can also be more on the outcome or process of alternative activities. For example, when people procrastinate working on their theses or working out by cleaning their apartment, they might either focus on how to best go about a thorough cleaning (process focus) or on the good feeling of having a spick and span apartment (outcome focus). We hypothesized that students focus also more on the outcome of the alternative activities when approaching the deadline for the intended activity: When the deadline of the focal activity is looming and time gets more precious regarding the pursuit of the goal, people need to increasingly justify why they are not engaging in the intended activity. That is, they have to ask themselves *why* they are engaged in alternative activities (i.e., focus more on the outcome) to rationalize their behavior.

With regard to process focus, we assumed substantial between-person heterogeneity. People engage in different kinds of activities while procrastinating. When they engage in activities that are hard to justify because of their low importance or urgency (e.g., watching TV), focusing on the activity itself (i.e., a higher process focus) may allow them to better block out

that they are procrastinating and thus 'get lost' in the activity. Because 'better' justifications are needed as the urgency of the focal goal intensifies with an approaching deadline, focusing increasingly on the process can be one way to circumvent the need for such justifications because a focus on the activity itself prevents having to think about the consequences of not engaging in the pursuit of the focal goal. In contrast, when people engage in activities that are easier to justify because they are important or urgent (e.g., studying for an exam), a higher process focus might be adaptive in that it may help people to pursue and achieve the non-focal goals. Unless investigated separately (e.g., by experimentally manipulating the importance or urgency of the alternative goal), these two opposing effects may cancel each other out in "real life" when having to consider a multitude of alternative activities and goals, and result in finding no change of process focus over time.

In sum, we hypothesized that outcome focus increases over time when people engage in a focal activity they intended to carry out (Study 1: working on a bachelor's thesis; Study 2: working out) as well as when they procrastinate. In addition, we hypothesized stability in the level of process focus over time when people engage in a focal activity that necessitates engagement in different non-automatized actions (i.e., working on a bachelor's thesis) but decreases when the focal activity does not change over time (i.e., workout routine). We held no hypothesis with regard to changes in the process focus of the alternative activity during procrastination episodes. We also tested the prediction of Krause and Freund (2014b) that, when engaged in focal activities, people should typically focus more on the process than the outcome when the deadline is still far away; however, right before the deadline, they should report a higher outcome than process focus (i.e., the suggested shift in goal focus).

General Method

Overview

We assessed goal focus regarding focal and alternative activities at the times when people had specified they intended to work on their bachelor's theses (i.e., Study 1) or to work out (i.e., Study 2). In a baseline questionnaire, participants provided individual time windows in which they planned to engage in the focal activity. However, because of the possibility that people want to change their plans or have to do so due to external circumstances, we allowed participants to change their individual time windows over the course of the study if they let us know about their change in plans in advance. During (Study 1) or at the end (Study 2) of these time windows, participants received a questionnaire and rated to what extent they focused on the outcome and process of the activities in which they were engaged. A procrastination (vs. non-procrastination) episode was defined as not having engaged (vs. having engaged) in the intended activity within the indicated time window.

Participants

The studies targeted bachelor students who shared the goal of submitting a bachelor's thesis (Study 1) or adults intending to follow a new workout routine at home (Study 2). Participants were recruited via advertisements in Internet forums (e.g., University of Zurich students' forums), the participant pool of the Department of Psychology at the University of Zurich, and – for Study 1 – mailing lists of different universities in the German-speaking part of Switzerland, Austria, and Germany. The advertisements included a link to a first online questionnaire, which was created and published using an online questionnaire tool (SoSci Survey; see www.soscisurvey.de).

Measures

The two longitudinal studies reported in this paper involved intensive data collection on numerous variables over an extended period of time in order to address different sets of questions. Here, we only describe the measures relevant to the current paper but all measures are listed in the Appendices A and B.

Goal focus. During (Study 1) or at the end (Study 2) of their time windows, the participants indicated whether they were working on their thesis (Study 1) or had been exercising (Study 2). If so, their goal focus was assessed with regard to this activity. If not, they reported what they were doing and rated their goal focus with regard to that activity. Goals focus was assessed with one item each for outcome ("To what extent are/were you focusing on what you want to achieve with this activity?") and process focus ("To what extent are/were you focusing on the activity itself?"). Both foci were assessed on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (very much).

Time. In Study 1, goal focus was assessed once a week during the individual time window that participants had specified as the time during which they intended to work on their bachelor's thesis. The study took place over a period of up to 14 weeks prior to the individual deadline. In Study 2, goal focus was assessed four times a week at the end of the individual workout window over a period of 8 weeks (i.e., over a total of 32 measurement occasions) prior to a post-study fitness test.

Data Analyses

Intraclass correlations ranged from ICC(1) = .16 to .45 in Study 1 and from ICC(1) = .22 to .56 in Study 2 (all $p < .001$), indicating that goal focus was nested and warranting multilevel

modeling (Bliese, 2009). Multilevel models can handle missing data and therefore maximize the utility of existing data (Kenny et al., 2006).

To account for within-person variability in time effects, we included random effects (i.e., random intercepts and slopes) in the models. Specifically, we estimated linear growth models for goal focus that allowed each individual to have his or her own initial level of process and outcome focus but assumed the same rate of change in both foci for each individual (i.e., random intercept models). Based on likelihood ratio tests (Bliese & Ployhart, 2002), we then compared these models to random slope models, in which the individuals additionally were allowed to have their own rate of change in both foci. If a random slope model did not fit the data better than the corresponding random intercept model, we chose the more parsimonious random intercept model as our final model. By taking random effects into account, autocorrelation within subjects is corrected (Lindsey, 1993). Following the recommendation of Sivo, Fan, and Witta (2005), we modeled autocorrelation in the level-1 residuals, which are common to longitudinal data (Campbell & Kenny, 1999). Time was centered such that the intercept estimates represented the predicted level of process and outcome focus for the typical person in the middle of the study (i.e., between weeks 7 and 8 in Study 1 and between measurement occasion 16 and 17 in Study 2).

Multilevel analyses were conducted with R (Version 3.3.1; R Development Core Team, 2016), using the nlme package (Pinheiro et al., 2016). In addition to reporting estimates, we calculated approximate 95% confidence intervals with the intervals function within the same package. We also calculated the likelihood-ratio-based adjusted pseudo R^2 for each model as implemented in the MuMIn package (Bartoń, 2016). This statistic offers the proportion of the

variance explained by comparing models including the explanatory variable (i.e., time) with models without it.

Study 1

Method

Sample. The original sample consisted of 118 undergraduate students. We excluded 13 participants (one person simultaneously had two fake accounts, seven only completed the baseline questionnaire, four did not fill out any questionnaire in time, and one person cancelled his thesis after one week), leaving a total of $N = 105$ bachelor students (82% female) aged 21 to 31 years ($M = 23.30$, $SD = 2.00$). The majority of participants were from Switzerland (73.3%), and the rest from Austria (13.3%), and Germany (13.3%). Most participants (41.9%) majored in psychology. The high proportion of female students in the sample reflects the ratio of male to female students in psychology and the social sciences in German-speaking countries.

Procedure. The study included a baseline questionnaire, weekly questionnaires during planned writing windows and a final questionnaire.

Baseline questionnaire. In the baseline questionnaire, participants responded to basic demographic questions, filled out an adapted version of the Pure Procrastination Scale (Krause & Freund, 2014a; Steel, 2010a), which measures trait procrastination, and the Academic Procrastination State Inventory (APSI; Schouwenburg, 1995; German translation by Helmke & Schrader, 2000). In addition, they rated different activities on various dimensions (e.g., pleasantness) that are not relevant for this paper. Also, students were asked to indicate the likelihood of writing their theses for every weekday. Based on these likelihoods, participants then chose the day on which they were most likely to regularly work on their theses and indicated a time window in which they planned to do so. Subsequently, the date on which

students intended to submit their theses was assessed. This allowed us to determine the start of the weekly assessment period for every participant, i.e., 14 weeks before the indicated date of submission. Participants could change their time windows over the course of the study but were asked to provide us with the new time windows at least one day before the desired change to avoid short-term changes in plans characteristic for procrastination.

Questionnaires during writing windows and final questionnaire. Starting 14 weeks before the indicated date of submission, each participant received a questionnaire once a week on the indicated 'writing day' in the middle of the indicated time window followed by an SMS prompt. Participants were asked to fill out the questionnaire as soon as possible and no later than 90 minutes after the prompt. In this questionnaire, the participants reported their current activity and goal focus was assessed as described above. Finally, the participants responded to a variety of other measures (e.g., mood, progress in the past week) that are not part of this article. After submission of their theses, participants completed a final questionnaire, also not relevant for the analyses in this paper. Participants who responded to all questionnaires on time were reimbursed with 40 Swiss francs or euros. Participants who missed questionnaires were reimbursed proportionally. On average, each participant received 27.60 Swiss francs.

Response rate and data handling. Overall, we sent out a total of 1,203 weekly questionnaires, of which 812 were completed on time (i.e., within 90 minutes), 120 too late, and 271 not at all. The average response time was 19.36 minutes (SD = 36.39 min). Results did not change substantially when including questionnaires in the analyses that were filled out too late. Therefore, we used all available data to increase statistical power and, thereby, the reliability of the results without biasing them.

Part IV

To increase the number of participants in the study, we also allowed students to participate when their submission date was fewer than 14 weeks away. This led to a larger number of completed questionnaires in the second half of the study (n = 541) in comparison to the first (n = 391). Fewest questionnaires were completed at the first measurement occasion (n =34) and most at the 12th measurement occasion (n = 82). For each measurement occasion, an average of 66.57 questionnaires was filled out.

When considering only the data from non-procrastination episodes (n = 289), n = 265 questionnaires were filled out in time, and n = 24 too late. More questionnaires were available from the second than the first half of the study (n = 129 vs. 160). Most questionnaires were available for the 11th, fewest for the first measurement occasion (n = 26 vs. 5). On average, at each measurement occasion, 20.64 students were working on their theses.

When considering only the data from procrastination episodes (n = 643), n = 547 questionnaires were filled out in time, and n = 96 too late. More questionnaires were available from the second than the first half of the study (n = 381 vs. 262). Most questionnaires were available for the last, fewest for the second measurement occasion (n = 60 vs. 33). On average, at each measurement occasion, 45.93 students procrastinated.

Fifteen participants submitted their theses before the final submission date. Hence, we restructured the data of these participants according to the actual submission date.[3]

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[3] We decided not to impute missing data due to the ambiguity of diary data and also unknown mechanisms of missingness. Trait procrastination did not predict the number of filled out questionnaires, $\beta = -.03$, $t(103) = -0.33$, $p = .74$.

Results

Preliminary analyses. At the time participants were prompted, they were asked to indicate the activity in which they were currently engaged. Most of the alternative activities that students reported fell into the categories of studying (i.e., university-related activities not related to the bachelor's thesis; $n = 148$), eating/cooking ($n = 110$), multimedia ($n = 54$), non-academic work ($n = 50$), relaxing/sleeping ($n = 40$), shopping ($n = 33$), sports, and chores (both $n = 22$). The remaining 14 categories were mentioned fewer than 20 times.

Some participants had reported two or fewer instances of writing or of procrastination over the 14 weeks. Therefore, the data of these participants could not contribute to the estimation of within-person changes. Additionally, based on the outlier test for the standardized residuals integrated in the nlme package, in the subset of observations from procrastination episodes, one data point was identified as an outlier and excluded from the analyses. Overall, the analyses were conducted on 289 observations from 85 students for the non-procrastination episodes and 643 observations from 102 students for the procrastination episodes.

During both non-procastination, $r = .20$, $p = .001$, and procrastination episodes, $r = .28$, $p < .001$, outcome and process focus correlated weakly but significantly.

Multilevel model of goal focus change. The comparison of goodness-of-fit indices of random intercept and random slope models showed that the random slope model fitted the data better for process focus in procrastination episodes (see Table 15). The difference was marginally significant for outcome focus in non-procrastination episodes. We decided to also report the more complex random slope model for this case in order to consider any potentially meaningful interindividual differences in slopes.

Table 15
Goodness-of-fit Measures for Random Intercept vs. Random Slope Models for Goal Focus During Writing (Study 1), Workout (Study 2), and Procrastination Episodes (Study 1 and 2)

	Outcome focus					Process focus				
Models	*df*	AIC	BIC	LL	LR	*p*	*df*	AIC	BIC	LL	LR	*p*
Study 1												
Writing episodes												
RI	5	1041.7	1060.0	-515.8			5	969.8	988.1	-479.9		
RS	7	1039.9	1065.5	-512.9	5.79	.055	7	972.7	998.4	-479.4	1.07	.584
Procrastination episodes												
RI	5	2880.5	2902.8	-1435.2			5	2677.8	2700.1	-1333.9		
RS	7	2884.5	2915.7	-1435.2	0.001	.999	7	2673.5	2704.8	-1329.8	8.31	.016
Study 2												
Workout episodes												
RI	5	14259.0	14291.0	-7124.5			5	12794.9	12826.9	-6392.4		
RS	7	14116.1	14161.0	-7051.1	146.85	<.001	7	12633.5	12678.4	-6309.8	165.36	<.001
Procrastination episodes												
RI	5	8542.5	8570.4	-4266.2			5	8305.7	8333.7	-4147.9		
RS	7	8545.2	8584.4	-4265.6	1.21	.545	7	8306.0	8345.1	-4146.0	3.72	.156

Note. Study 1: $N = 289$ observations nested in 85 students (writing episodes) and 643 observations nested in 102 students (procrastination episodes). Study 2: $N = 4{,}484$ observations nested in 325 participants (workout episodes) and 1,978 observations nested in 304 participants (procrastination episodes). RI = Random intercept model; RS = Random slope model; AIC = Akaike information criterion; BIC = Bayesian information criterion; LL = log likelihood; LR = Likelihood ratio.

The results of the multilevel analyses are presented in Table 16 and in Figure 1. The table has two sets of parameter estimates. The first set, the fixed effects, can be thought of as the results for typical students, with the time estimate representing the change in outcome and process focus per week. These fixed effects are represented by the bold dark line in Figure 1. The second set of effect estimates in Table 16 shows the random effects. These describe the extent to which people varied at the two levels of analysis: At the upper level (i.e., intercept and time), the estimates denote the extent to which people diverted from the overall average. At the lower level (i.e., residual), the estimates refer to the extent to which individual data points varied from the values predicted by the model. The upper-level random effects are presented in Figure 1 by the variability in individual regression lines from the overall averages.

Writing episodes. As hypothesized, outcome focus significantly increased over time for the writing episodes. Specifically, when students worked on their theses, they showed a 0.08 unit weekly increase in outcome focus ($p = .001$). Thus, on average, outcome focus at the last measurement occasion was 1.12 units higher compared to the beginning of the study. In addition, we observed substantial between-person random effects. The variability of the light dark lines around their respective bold dark lines in Figure 1 is one way of illustrating this variability. These are model-based estimates of the true growth patterns of the different individuals in the sample. The lower panel of Table 16 shows numerical values of the random effect parameters for the population. The *SD* of 1.21 for the intercept indicates that there was substantial between-person heterogeneity in the starting level of students. It indicates that 95% of the population varied between ± 2.42 of the typical intercept. The between-person variability in the slope was small ($SD = 0.12$), indicating that 95% of the population varied between ± 0.24 units of the typical slope (see Figure 1).

Table 16
Parameter Estimates for Linear Growth Models of Goal Focus During Writing and Procrastination Episodes (Study 1)

	Writing Episodes						Procrastination Episodes					
	Outcome focus (RS)			Process focus (RI)			Outcome focus (RI)			Process focus (RS)		
Parameter	*Est.*	*SE*	*p*	*Est.*	*SE*	*p*	*Est.*	*SE*	*p*	*Est.*	*SE*	*p*
Fixed effects												
Intercept	5.06	0.15	< .001	5.05	0.10	< .001	3.69	0.13	< .001	4.21	0.11	< .001
Time	0.08	0.03	.001	0.002	0.02	.936	0.04	0.02	.058	-0.002	0.02	.934
Random effects	*Est. [95% CI]*			*Est. [95% CI]*			*Est. [95% CI]*			*Est. [95% CI]*		
Intercept	1.21 [0.98, 1.50]			0.47 [0.19, 1.14]			0.91 [0.68, 1.22]			0.82 [0.63, 1.08]		
Time	0.12 [0.07, 0.21]			-			-			0.11 [0.07, 0.19]		
Correlation	.12 [-.35, .54]			-			-			.38 [-.20, .76]		
AR(1)	-.09 [-.33, .16]			.25 [.03, .45]			.08 [-.02, .18]			.03 [-.09, .14]		
Residual	1.05 [0.92, 1.20]			1.23 [1.08, 1.42]			2.13 [2.00, 2.27]			1.74 [1.62, 1.87]		
Pseudo R^2 [a]	.08			.02			.01			.02		

Note. N = 289 observations nested in 85 students (writing episodes) and 643 observations nested in 102 students (procrastination episodes). RI = Random intercept model; RS = Random slope model; Correlation = Intercept-Slope correlation; AR(1) = First-order autoregression. [a] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016).

In contrast to outcome focus and as hypothesized, process focus was stable over time for non-procrastination episodes (p = .94). Although Figure 1 indicates some between-person heterogeneity, the between-person random effects were relatively small (see Table 16). The intercept *SD* of 0.47 indicates that 95% of the population varied between ± 0.94 of the typical intercept.

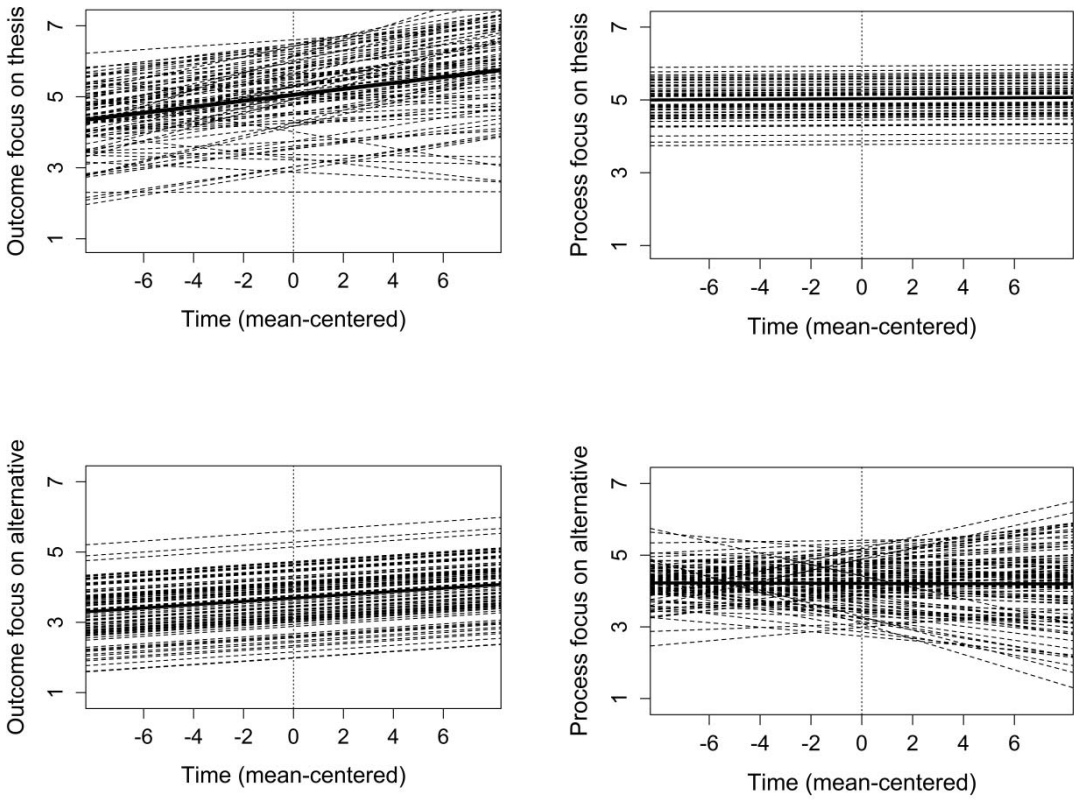

Figure 1. Spaghetti plot of average (thick) and subject-specific (thin) time courses for outcome (left) and process focus (right) during writing (top) and procrastination episodes (bottom) in Study 1.

To test whether the level of process and outcome focus differed at the end vs. the beginning of the study, we aggregated the data of the first four measurement occasions (i.e., the first month of the study) and compared them with the aggregated data from the last four

measurement occasions (i.e., the last month of the study). The levels of outcome ($M = 4.79$, $SD = 1.68$) and process focus ($M = 5.08$, $SD = 1.21$) did not differ during the first month of the study, $t(105) = -1.07$, $p = .29$, but significantly differed during the last month. As predicted, outcome focus ($M = 5.52$, $SD = 1.61$) was higher, $t(181) = 1.98$, $p = .02$ (one-tailed), than process focus ($M = 5.08$, $SD = 1.43$). We were not able to compare the two foci at the weekly level because we did not have enough observations for every week from non-procrastination episodes.

Procrastination episodes. For the procrastination episodes, the expected increase in outcome focus only reached marginal significance ($p = .058$) and must be interpreted with caution. For procrastination episodes, students showed a 0.04 unit weekly increase in outcome focus as the deadline for the thesis approached. Thus, on average, outcome focus at the last measurement occasion was 0.56 unit higher compared to the beginning of the study. The *SD* of 0.91 for the intercept in Table 16 indicates that there was some between-person heterogeneity in the starting level of outcome focus: 95% of the students varied between ± 1.82 of the typical intercept.

As was true for the focal activity, we did not find any change in process focus over time for the alternative activities ($p = .93$). However, Figure 1 and Table 16 indicate between-person heterogeneity: The intercept *SD* of 0.82 indicates that 95% of the participants varied between ± 1.64 of the typical intercept. The slope *SD* of 0.11 indicates that 95% of the students varied between ± 0.22 units of the typical slope.

Furthermore, the level of outcome and process focus differed significantly during the first month, $t(274) = -2.58$, $p = .01$, with outcome focus ($M = 3.63$, $SD = 2.27$) lower than process focus ($M = 4.27$, $SD = 1.88$). However, this difference disappeared over the course of the study as the students focused equally on the outcome ($M = 3.90$, $SD = 2.36$) and the process of the

alternative activities ($M = 4.14$, $SD = 2.09$) in the month prior to the deadline for the thesis, $t(450) = -1.15$, $p = .25$.

The estimates reported at the bottom of Table 16 show that there was no evidence for autocorrelation in the level-1 residuals in all four models except for the model for process focus during non-procrastination episodes.[4]

Brief Discussion

Study 1 found a significant increase over time in outcome focus for non-procrastination episodes and a marginally significant increase for procrastination episodes. Thus, it seems that with an approaching deadline for a focal activity, the positive and/or negative consequences associated with the focal activity as well as the alternative activity become more salient. People may need to increasingly justify their behavior when they procrastinate as the deadline approaches by focusing on the outcome of the alternative activities.

As hypothesized, there was no change in process focus for non-procrastination episodes. This may be due to the fact that working on a thesis encompasses a variety of different behaviors that are all fairly new to undergraduate students and thus require attention as to *how* to perform them (Zimmerman & Kitsantas, 1997, 1999). The different trajectories of the two goal foci led to a relatively higher outcome than process focus towards the end of the study for non-

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[4] The weak autocorrelation would disappear in the corresponding random slope model. However, as the random slope model did not fit the data better, we stayed with the random intercept model, which does not differ from the more complex model regarding the estimates of the fixed effects. In addition, non-linear (i.e., quadratic and cubic) models did not explain the data better than linear models and were therefore not reported.

procrastination episodes, and to a comparable level of outcome and process focus for alternative activities.

Study 2 aimed at replicating the increase in outcome focus found in Study 1 with a larger sample in a non-academic context, using a different type of endpoint and a different focal activity (i.e., work out). In contrast to Study 1, we hypothesized that process focus decreases over the course of the study for workout episodes.

Study 2

Method

Sample. The sample consisted of $N = 346$ participants (65% female) aged 18 to 65 years ($M = 32.35$, $SD = 11.21$) who attended a pre-study fitness test; $n = 242$ remained in the study until the post-test.[5] Multilevel modeling allowed us to include all available data at each point in time, including that of the $n = 104$ participants who dropped out over the course of the study. As for highest level of education completed, 2.3% of the participants reported having completed compulsory education/lower secondary education, 45.1% upper secondary level education (vocational education, baccalaureate school, or upper secondary specialized schools), 50.3% a

[5] We decided not to impute data due to the ambiguity of diary data and also unknown mechanisms of missingness. Trait procrastination predicted the number of filled out questionnaires, $\beta = -.19$, $t(344) = -3.51$, $p = .001$, but only accounted for 3.5% of the variance. Similarly, dropouts ($M = 36.65$, $SD = 11.92$) reported higher trait procrastination than completers ($M = 33.79$, $SD = 11.36$), $t(344) = -2.12$, $p = .035$, but the effect size was small ($d = 0.25$). Neither education, χ^2 $(6, N = 346) = 9.00$, $p = .17$, nor initial fitness as assessed by the sit-to-stand test, $\text{Exp}(B) = 0.997$, Wald = 0.90, $df = 1$, $p = .77$, predicted whether the participants completed the study or not.

university degree, and 2.3% other degrees. Most participants were employed (76.4%) or students (17.8%).

Procedure. The procedure in Study 2 was as similar as possible to Study 1 except that the pre- and post-levels of physical fitness were assessed.

Screening, pre-test, and baseline questionnaire. The participants first filled out a health screening questionnaire, which consisted of the somatization subscale of the SCL-90-R (Derogatis, 1977; Franke, 1995), an indication of number of repetitions in a one-minute sit-to-stand test (Bohannon et al., 2010), various questions on cardiovascular health (e.g., high blood pressure), and an open question on existing health issues. We did not allow people to enter the study if they reported a sum score greater than 30 on the SCL-90-R, less than 20 repetitions in the sit-to-stand test, any cardiovascular diseases, or a condition that might pose a risk to the participant (e.g., pregnancy). After the screening questionnaire, participants had an appointment with a fitness instructor and a student assistant in a gym in groups of up to five participants. The fitness instructor showed the workout routine that consisted of a high-intensity interval training of four sets of eight different exercises (i.e., jumping jack, jumping sideways, lunge, push-up, swimmer, plank, sit-up, and high knees). This workout does not require any equipment and can be performed at any location. The workout alternates between 20 second periods of intense exercise with 10 second recovery periods. Four workout sets are considered one workout session and take 16 minutes. The instructor showed the participants one set, asked them to do the exercises, and corrected them if necessary. Subsequently, half of the participants stayed with the instructor to take a pre-test consisting of four different exercises. The other half went one by one to a separate room, where the student assistant assessed various physical measures (e.g., body fat). Finally, the two groups of participants switched.

Part IV

Participants received a link to a video with the full workout routine, which they could access at any time. They were asked to do one workout practice session at home and subsequently received the same baseline questionnaire as the participants in Study 1 (excluding the APSI), which included the question what personal goals they wanted to pursue with the workout, and, in addition, different scales that are not relevant for this paper. As in Study 1, participants indicated time windows in which they planned to work out and could change their time windows over the course of the study when they wanted to or had to change their plans. Different to Study 1, they were asked to indicate *four* weekly time windows of one hour in which they planned to do the exercises.

Questionnaires during workout windows, post-test, and final questionnaire. Starting eight weeks before the week in which the post-study fitness test took place, each participant received a questionnaire four times a week on the indicated 'workout day' at the end of the indicated time window followed by an SMS prompt. The participants were asked to fill out the questionnaire as soon as possible and no later than 15 minutes after the prompt. In this questionnaire, participants indicated what they had been doing and goal focus was assessed as described above. Finally, the participants rated a variety of other measures (e.g., mood) not considered for this article.

In addition, participants filled out weekly questionnaires that are not relevant for the present analyses. At the end of the study, participants did a post-study fitness test, which was identical to the pre-test, and then completed a final questionnaire, which is also not relevant for the analyses in this paper.

Participants who attended the post-test and filled out at least 50% of all questionnaires (n = 184) received an extended individualized feedback on the development of subjective (e.g.,

mood) and objective measures (e.g., body weight pre-post) over the course of the study. In addition, they were given a voucher for a free entry to the gym, in which the instructions had taken place. Participants who attended the post-test and filled out less than 50% of all questionnaires (n = 58) received feedback regarding the objective measures and the voucher.

Response rate and data handling. Overall, we sent out a total of 8,957 questionnaires during planned workout windows, 4,766 of which were completed in time (i.e., within 15 minutes), 1,707 too late, and 2,484 not at all. The average response time for responses on time was 5.22 minutes (SD = 3.52 min) and for late responses 370.47 minutes (SD = 628.75 min). Results did not change substantially when including in the analyses questionnaires that were filled out too late. Therefore, we used all available data to increase statistical power in order to increase the reliability of the results without biasing them. Most questionnaires were filled out at the first (n = 295) and fewest (n = 166) at the 31st measurement occasion. For each measurement occasion, an average of 202.28 questionnaires was filled out.

When considering only the data from non-procrastination episodes (n = 4,486), n = 3,449 questionnaires were filled out in time, and n = 1,037 too late. Most questionnaires were available for the 1st, fewest for the 28th measurement occasion (n = 245 vs. 95). On average, at each measurement occasion, 140.19 participants reported to work out as intended.

When considering only the data from procrastination episodes (n = 1,987), n = 1,317 questionnaires were filled out in time, and n = 670 too late. Most questionnaires were available for the 12th, fewest for the 6th measurement occasion (n = 81 vs. 43). On average, at each measurement occasion, 62.09 people reported to procrastinate.

Results

Preliminary analyses. At the time participants were prompted, they were asked to indicate

the activity in which they had been engaged. Most of the alternative activities fell into the categories relaxing/sleeping (n = 297), eating/cooking (n = 218), working (n = 201), meeting friends/family (n = 180), and being on the way (n = 179). The remaining 20 categories were mentioned less than 132 times.

Some participants showed almost no variance regarding procrastination over the course of the study (i.e., they worked out or procrastinated in fewer than 2 out of 32 cases). The data of these participants could not contribute to the estimation of within-person changes. Overall, the analyses were conducted on 4,484 observations from 325 participants for the non-procrastination episodes and 1,978 observations from 304 participants for the procrastination episodes.

During workout episodes, outcome and process focus correlated weakly but significantly, $r = .32, p < .001$. During procrastination episodes, outcome and process focus correlated moderately, $r = .41, p < .001$.

Multilevel model of goal focus change. The comparison of goodness-of-fit indices of random intercept and random slope models showed that the random slope models fitted the data better only for workout episodes (see Table 15).

The results of the multilevel analyses are presented in Table 17 and in Figure 2. The interpretation of the parameters and figures is identical to Study 1. The time estimate represents the change in outcome and process focus per measurement occasion.

Workout episodes. As expected, outcome focus significantly increased over time for the workout episodes. Specifically, when participants did not procrastinate, they showed a 0.01 unit increase per measurement occasion in outcome focus ($p < .001$). Thus, on average, outcome focus at the last measurement occasion was 0.32 units higher compared to the beginning of the study. In addition, we observed a substantial between-person random effect: The *SD* of 1.23 for

Table 17
Parameter Estimates for Linear Growth Models of Goal Focus During Workout and Procrastination Episodes (Study 2)

	Workout Episodes						Procrastination Episodes					
	Outcome focus (RS)			Process focus (RS)			Outcome focus (RI)			Process focus (RI)		
Parameter	*Est.*	*SE*	*p*	*Est.*	*SE*	*p*	*Est.*	*SE*	*p*	*Est.*	*SE*	*p*
Fixed effects												
Intercept	4.68	0.07	< .001	4.82	0.07	< .001	3.80	0.08	< .001	4.05	0.08	< .001
Time	0.01	0.003	< .001	-0.01	0.003	< .001	0.02	0.01	.002	0.01	0.01	.036
Random effects	*Est. [95% CI]*			*Est. [95% CI]*			*Est. [95% CI]*			*Est. [95% CI]*		
Intercept	1.23 [1.12, 1.35]			1.06 [0.98, 1.15]			1.00 [0.81, 1.23]			1.13 [1.00, 1.28]		
Time	0.04 [0.03, 0.05]			0.03 [0.03, 0.04]			-			-		
Correlation	.29 [.13, .44]			0.67 [0.55, 0.77]			-			-		
AR(1)	.08 [.04, .11]			.17 [.13, .20]			.05 [-.01, .11]			.04 [-.02, .10]		
Residual	1.04 [1.01, 1.06]			0.90 [0.88, 0.93]			1.95 [1.89, 2.03]			1.81 [1.75, 1.87]		
Pseudo R^2 [a]	.04			.05			.01			.002		

Note. N = 4,484 observations nested in 325 participants (workout episodes) and 1,978 observations nested in 304 participants (procrastination episodes). RI = Random intercept model; RS = Random slope model; Correlation = Intercept-Slope correlation; AR(1) = First-order autoregression. [a] Likelihood-ratio based adjusted pseudo R^2 (Bartoń, 2016).

the intercept in Table 17 indicates that 95% of the participants varied between ± 2.46 of the typical intercept. In contrast, the between-person variability in the slope was small with a *SD* of 0.04, which indicates that 95% of the sample varied between ± 0.08 units of the typical slope (see also Figure 2).

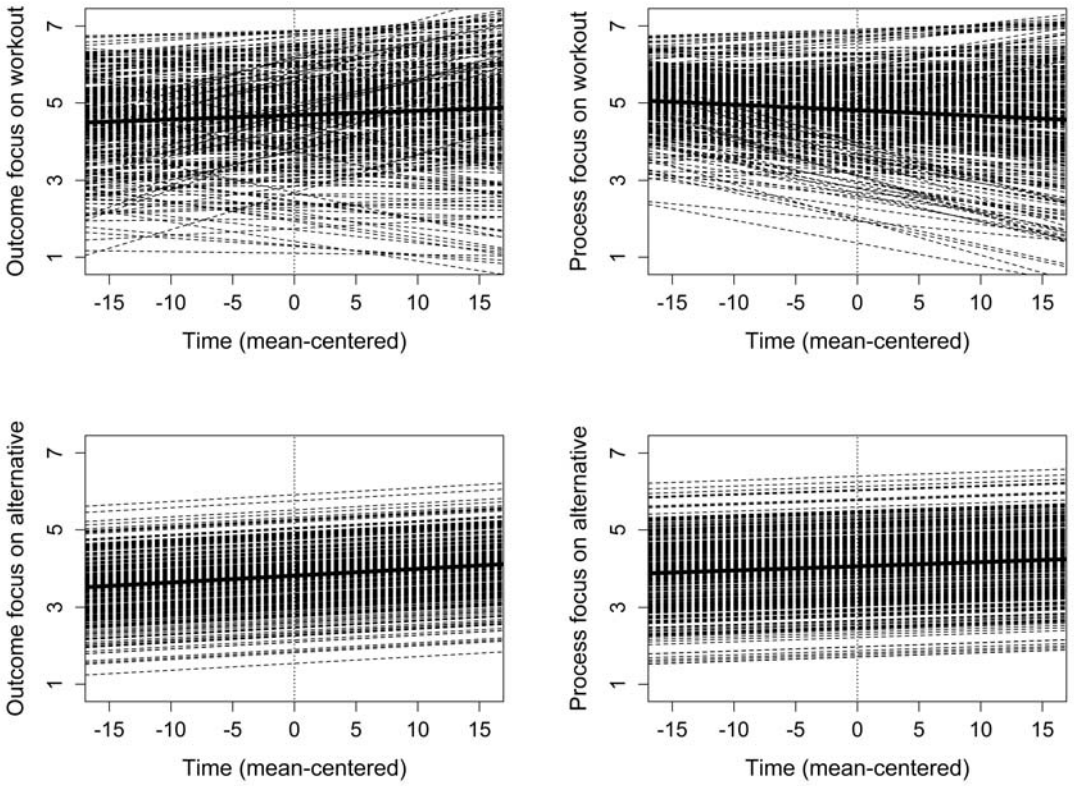

Figure 2. Spaghetti plot of average (thick) and subject-specific (thin) time courses for outcome (left) and process focus (right) during workout (top) and procrastination episodes (bottom) in Study 2.

In contrast and as expected, process focus significantly decreased over time for the non-procrastination episodes. Specifically, when the participants worked out at the intended time, they showed a 0.01 unit decrease per measurement occasion in process focus ($p < .001$). Thus, on average, process focus at the last measurement occasion was 0.32 units lower compared to the beginning of the study. There were also substantial between-person random effects for process

focus; the *SD* of 1.06 for the intercept in Table 17 indicates that 95% of the sample varied between ± 2.12 of the typical starting level (see also Figure 2). However, similar to outcome focus, the between-person variability in the slope was small (*SD* = 0.03).

As in Study 1, we aggregated the data of the first four measurement occasions (i.e., the first week of the study) and the last four measurement occasions (i.e., the last week of the study) to test whether the relative level of process and outcome focus differed at the beginning vs. the end of the study. Outcome focus (*M* = 4.54, *SD* = 1.64) was significantly lower than process focus (*M* = 5.16, *SD* = 1.22) during the beginning of the study, $t(1534) = -8.79$, $p < .001$, but the two foci were of comparable level (outcome focus: *M* = 4.73, *SD* = 1.71; process focus: *M* = 4.94, *SD* = 1.50) at the end of the study, $t(870) = -1.92$, $p = .055$.

Procrastination episodes. As expected, outcome focus significantly increased over time for the procrastination episodes ($p = .002$). When the participants were engaged in alternative activities, they showed a 0.02 unit increase per measurement occasion in outcome focus. Thus, on average, outcome focus at the last measurement occasion was 0.64 unit higher compared to the beginning of the study. The *SD* of 1.00 for the intercept indicates that in the starting level of participants there was some between-person heterogeneity (i.e., 95% of the participants varied between ± 2.00 of the typical intercept).

Similarly, process focus significantly increased over time ($p = .04$). When participants procrastinated (i.e., they engaged in alternative activities), they showed a 0.01 unit increase per measurement occasion in process focus. Thus, on average, process focus at the last measurement occasion was 0.32 unit higher compared to the beginning of the study. The *SD* of 1.13 for the intercept indicates that there was some between-person heterogeneity in the starting level (i.e., 95% of the sample varied between ± 2.26 of the typical intercept).

Part IV

Participants focused less on the outcome (M = 3.55, SD = 2.23) than the process (M = 4.15, SD = 2.12) of the alternative activities during the first week of the study, $t(397) = -2.76$, p = .01. Although the difference between the two foci became smaller over time, process focus (M = 4.15, SD = 2.16) remained higher than outcome focus (M = 3.77, SD = 2.18) until the last week of the study, $t(556) = -2.07$, p = .04.

Finally, the estimates reported at the bottom of Table 17 suggested a weak autocorrelation in the level-1 residuals in the two models for workout episodes. As in Study 1, we tested whether non-linear (i.e., quadratic and cubic) models explain the data better than linear models. This was the case for process focus for workout episodes and outcome focus for procrastination episodes (see Figure 3). The plots in Figure 3 suggest that the significant linear decrease of process focus for workout episodes is due to a decline at the beginning and again the end of the study, and stability around the middle of the study. In contrast, the significant increase in outcome focus for procrastination episodes is driven by a linear increase after an initial short-term drop. The linear increase is followed by another drop in the last two weeks of the study.

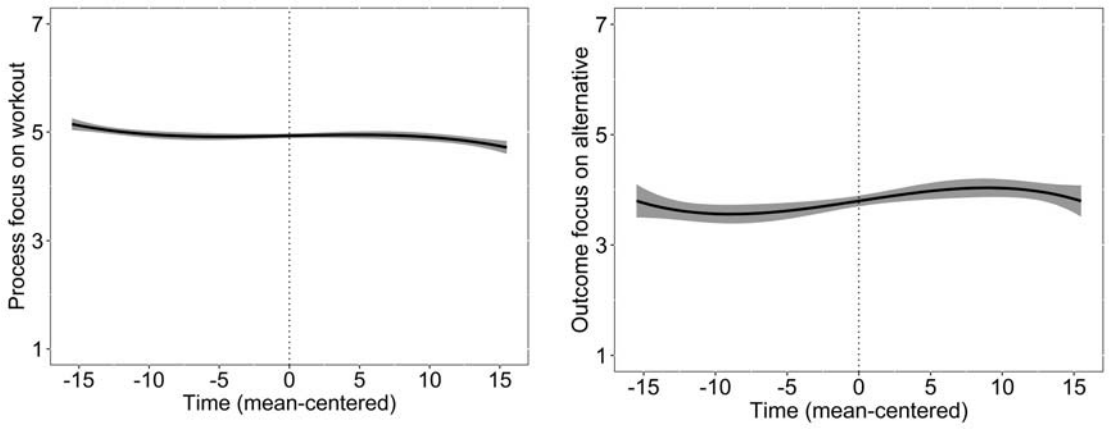

Figure 3. Non-linear (i.e., cubic) average time courses of process focus for workout episodes (left) and outcome focus for procrastination episodes (right) in Study 2. Shaded areas represent 95% confidence intervals.

Brief Discussion

Study 2 largely replicated the results of Study 1 in a non-academic workout context. As the endpoint for the focal activity (i.e., a post-study fitness test) approached, outcome focus increased regardless of whether participants procrastinated or not. As expected, and different to Study 1, process focus decreased over the course of the study for non-procrastination episodes. This might be the case because participants became more and more familiar with the exercises the more often they had performed them, so that they no longer required attention as to how to execute them. Note, however, that participants did not focus more on the outcome than the process at the end of the study.

General Discussion

The present studies investigated whether goal focus (i.e., outcome and process focus) changes with an approaching endpoint for a focal activity (i.e., writing a bachelor's thesis or working out) when people engage in the focal activity as well as when they engage in alternative activities while procrastinating. Outcome focus increased over time regardless of whether participants procrastinated or not. The two studies showed different trajectories of process focus over time: When goal pursuit required to engage in a variety of activities of high complexity (i.e., completing a bachelor's thesis), process focus was stable; when the goal comprised a set of clearly delineated actions (exercises) that do not change over time, process focus decreased over time. For the goal of working out regularly, we also observed interindividual differences regarding the development of process focus over time. These differences may reflect interindividual differences in underlying processes such as changes in the motivation to work out and be relevant predictors of successful goal achievement.

The observed increase in outcome focus for the focal activity supports the hypothesis that, once a deadline is looming, negative (in case of failure) and/or positive (in case of success) consequences become more salient. In turn, the increased salience may induce a final "boost" to motivation and be adaptive (Krause & Freund, 2014b). In contrast, when the deadline is still far away, a focus on the outcome may not prompt effective actions to bring about a desired goal (Pham & Taylor, 1999) and be linked to positive fantasies that interfere with goal attainment (Oettingen & Wadden, 1991). This reasoning is also in line with Temporal Construal Theory (Trope & Liberman, 2003) according to which a concrete construal of a goal leads to earlier enactment of goal-directed behavior. For example, with an approaching deadline, students might envision very concrete consequences of failing or passing the thesis such as a fight with vs. praise from their parents. This, in turn, may motivate people to work on and finish their theses. However, in contrast to Temporal Construal Theory, goal focus refers to the salience of process and outcome within a given goal, which explains unique variance over and above perceived concreteness (Freund & Hennecke, 2012).

Taken together, the findings of the two studies suggest that the approaching deadline for the focal activity also affects the way people engage in alternative activities. We interpret the increase in outcome focus as a reaction to the increased salience of the endpoint for the focal activity and the anticipated positive (in case of goal achievement) or negative (in case of failure) consequences. For the alternative activity, the closer the deadline, the more people may need to justify procrastinating, and they may do so by stressing the urgency or importance of the outcomes related to the alternative activity. Whether people can temporarily justify their procrastination likely depends on the alternative activities in which they engage. For example, procrastination may be particularly easy to rationalize when students engage in alternative

activities that are related to the focal activity (e.g., preparing for an exam instead of writing the thesis) as the two activities might serve the same higher-order goal (e.g., obtaining a degree). In contrast, people may have more difficulty rationalizing their behavior when they engage in alternative activities that are not related to the focal activity (e.g., watching TV). In these situations, focusing on why one is engaged in an incongruent alternative activity (i.e., adopting an outcome focus) could remind people of the fact that they are not doing what they intended to do and lead to negative emotions such as guilt (Ferrari, 1991b; Pychyl & Little, 1998).

Whereas students' process focus evolved differently over time when they engaged in alternative activities instead of writing their theses (Study 1), there were no such differences in the change trajectories when the participants engaged in alternative activities instead of working out (Study 2). The reasons for these different findings in Study 1 and 2 may be due to context (e.g., the consequences of failing to follow a workout routine are less serious than failing the bachelor's thesis, which may have implications for how people engage in alternative activities), sample (e.g., student-specific effects), or activity effects (e.g., despite substantial overlap, the participants engaged in different alternative activities in the two studies).

Overall, these studies reinforce earlier research treating outcome and process focus as two separate dimensions rather than two opposite poles of the same dimension (e.g., Freund & Hennecke, 2012; Freund et al., 2010). In both studies, the two foci were weakly positively correlated and also the asymmetric overall time trends suggest a two-dimensional conceptualization. Moreover, the studies support the idea that goal focus has a state component that changes depending on context (i.e., distance from deadlines and the type of activity; see also Krause & Freund, 2014b).

Part IV

Limitations and Strengths

The present studies were limited in that our questionnaire may have caused reactivity effects and operated as a kind of intervention by directing the participants' awareness to procrastination behavior (e.g., Schmitz & Wiese, 2006). Moreover, as is true for all correlative studies, we cannot rule out the possibility of an unmeasured time-varying third variable. Further studies using an experimental design, for example by manipulating time to the deadline, are needed to address the question of causality. In addition, the time windows the students were given to respond to the questionnaire was rather broad in Study 1. However, we encouraged them to respond as quickly as possible and most of them did so.

Did we actually measure procrastination with our operationalization? Could it not be the case that participants adjusted the time of the target activity very shortly? In some cases, such adjustments might have been necessary (e.g., computer crash when wanting to work on the thesis; a bout of feeling sick during the time of the scheduled work-out). However, short of such incidents, deciding not to engage in the intended activity but instead doing something else (that might seem highly important at the time, such as cleaning the house before sitting down to work on one's thesis) fits the definition of procrastination. To avoid a systematic bias in reporting incidents of procrastination caused by rationalizations that justify procrastination after the fact, participants picked the intended times for the target activity beforehand. We maintain that – although we might have incorrectly categorized some incidents of true external obstructions of the targeted activity as procrastination – this is an ecologically valid way of assessing procrastination while it takes place.

A major strength of the studies is their design, including the assessment of goal focus in non-procrastination and procrastination episodes in real-life situations. Moreover, in order to

mimic the everyday lives of people as closely as possible, we allowed each person to set their time windows for the intended activity and change them if necessary. Sending the questionnaires during these time windows allows circumventing memory biases present in retrospective reporting.

Future Directions

Participants in both studies varied both regarding the level and the change of goal focus over time. Further research is needed to identify variables causing these interindividual differences and explore their consequences for goal pursuit and achievement. For example, when working on their theses, students differed only with regard to their starting levels of process focus, which was stable over time. It would therefore be interesting to explore to what extent these initial differences can explain later differences in various outcomes such as performance. Similar investigations are needed with regard to procrastination episodes to better understand the implications of interindividual differences in the starting level and the change of goal focus over time.

Goal focus may be associated with how reasons for acting relate to competence. According to Cognitive Evaluation Theory (e.g., Deci & Ryan, 1980, 1985), a subset of SDT, intrinsic motivation can change over time depending on two processes, the perceived locus of causality and the perceived competence. When the perceived locus of causality is "in operation," increases (vs. decreases) in perceptions and feelings of self-determination lead to increases (vs. decreases) in intrinsic motivation. When the perceived competence is in operation, increases (vs. decreases) in perceptions and feelings of competence predict increases (vs. decreases) in intrinsic motivation. Such changes in feelings of competence may be related to goal focus. For example, people may feel more competent when focusing on the process of goal pursuit. Note, however,

that the definition of goal focus is mute regarding the underlying nature of the reasons for engaging in goal pursuit as people can focus on the process and/or outcome of goal pursuit in either case when being intrinsically or extrinsically motivated (see Freund et al., 2012).

Although some of the previous studies on the effects of goal focus were longitudinal (e.g., Krause & Freund, 2016), more longitudinal research is needed to better understand the dynamics underlying procrastination. Importantly, such analyses need to consider intraindividual change over time to complement previous research that has largely focused on differences between persons. In addition, we believe that procrastination research is best served using an experience sampling methodology to measure variables of interest while people carry out activities in their daily lives, allowing fine-grained analyses of momentary motivation and their fluctuations from situation to situation. Moreover, this methodology allows investigating time effects in procrastination episodes at an activity level.

Conclusion

To the best of our knowledge, these two studies are the first to provide insights into how goal focus changes with an approaching endpoint when people engage in focal and alternative activities. In sum, outcome focus increased over time in both procrastination and non-procrastination episodes, whereas process focus was stable when the focal activity involved engagement in different activities but decreased when the focal activity was repetitive. The two studies thus contribute to a dynamic understanding of goal focus by suggesting that people adjust their goal focus to the type of activity and are under the influence of approaching deadlines. Although most of the activities in which people engage when they procrastinate are unrelated to the intended goal, deadlines for those goals nevertheless affect how people pursue such alternative activities. Given the existing evidence that goal focus is related to goal pursuit and

procrastination (Freund & Hennecke, 2012, 2015; Krause & Freund, 2016), knowing how goal focus changes over time as people carry out activities in their daily lives in both procrastination and non-procrastination episodes is crucial for enhancing our understanding of procrastination.

PART V: A MOTIVATIONAL LIFESPAN PERSPECTIVE ON PROCRASTINATION: THE DEVELOPMENT OF DELAYING GOAL PURSUIT ACROSS ADULTHOOD

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Abstract

Procrastination is a highly common self-regulation failure that has been studied mainly in the educational context, but has been largely neglected in lifespan psychology. Adopting a lifespan motivational perspective, we focus on adult development and maintain that, historically seen, adults nowadays have to take on a more important and active role in pursuing their goals due to the deregulation of the life course and increased life expectancy (Wrosch & Freund, 2001). This requires higher self-regulatory skills, particularly with increasing age. When self-regulation fails, people may postpone important developmental goals and experience negative consequences in their psychological, physical, and economic lives. We propose research questions that might foster the understanding of procrastination from a lifespan perspective.

Part V

Introduction

Procrastination is well known to most of us: The intention to perform a certain activity, yet failing to implement it within the desired time frame. When procrastination is a chronic behavior, it becomes a maladaptive lifestyle with as many as 20–25% of the healthy adult population who engage in a needless delay of relevant tasks across situations and settings (see Díaz-Morales & Ferrari, 2015).

Although procrastination is a widespread phenomenon, it has been primarily studied in the context of academic procrastination (e.g., Schouwenburg, Lay, Pychyl, & Ferrari, 2004) but neglected in lifespan research. In this article, we take a lifespan approach, focusing on adult development and drawing on the controversially debated idea of a deregulation and individualization of the life course over historical time (e.g., Macmillan, 2005).[6] We consider that the proposed deregulation may have contributed to new challenges that necessitate higher self-regulatory skills throughout adulthood, and particularly in older adulthood. We touch on these issues and suggest that, when self-regulation fails, people may procrastinate on important developmental goals or tasks.

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[6] We do not elaborate on procrastination in childhood and adolescence in this paper. Note, however, that little is known about the development of procrastination and its manifestation in these life phases. For effects of parenting on children's procrastination, see Pychyl, Coplan, and Reid (2002), and Won and Yu (2018). For the neurobiological underpinnings of procrastination, see Steel (2010). For the role of motivation in relations between self-efficacy and procrastination in children, see Katz, Eilot, and Nevo (2014).

Procrastination is a multi-faceted phenomenon (Steel, 2007) and a full understanding requires the integration of sociocultural, interpersonal, situational, emotional, motivational, cognitive, personality, and biological perspectives. As desirable as a comprehensive integration of these various perspectives is, the field is not anywhere close to allowing such an endeavor. Therefore, we attempt to contribute towards a better understanding of procrastination by integrating a lifespan perspective, focusing on adult development, and an action-theoretical perspective, centering on goal-directed action that is embedded in a specific context.

Regarding adult age differences, first empirical evidence suggests that older adults procrastinate less than younger adults (e.g., Steel & Ferrari, 2013). We elaborate on potential mechanisms that might explain these age differences. Outlining a future research agenda on a lifespan approach to procrastination, we derive potential research questions that could guide future studies throughout this article. We end with some considerations regarding how to assess procrastination in this context.

Humans as Active Agents of Their Development

According to action-theoretical approaches, people intentionally initiate, maintain, and terminate goal-related behaviors. Embracing this approach, a number of lifespan psychological theories view goals as the central units of analysis (Brandtstädter & Lerner, 1999; Freund, 2007; J. Heckhausen, 1999), proposing that development emerges in an interplay of actively creating and reacting to one's environment. That is, within the constraints determined by biological, social, and personal factors, people select and pursue personal goals, which provide them with purpose in life and structure their actions across the lifespan.

Successful development requires that people master both normative and non-normative developmental demands or tasks, which shape the types of goals people set at different points in

life, the strategies and resources they use to pursue them, and the conditions under which they engage in or disengage from goals (Settersten, 2003; Wrosch & Freund, 2001). Regarding normative developmental goals, the social system creates a scaffold for life-course patterns in the form of a recognized age-normative timetable of being 'on-time' or 'off time' to pursue and complete developmental goals throughout life (e.g., find a romantic partner in early adulthood, retirement in late adulthood). Whereas successful mastery of developmental goals and 'on-time' experiences lead to subjective well-being and promote further psychological growth, 'off-time' experiences and failure endangers further progress and the mastery of developmental goals in later phases of the life span (e.g., Havighurst, 1952).

In contrast, non-normative events (e.g., relocation, accidents, or winning in a lottery) usually occur at less predictable points in the life course. Institutionalized support systems and social norm orientation (e.g., role models) are less available to support individuals in the management of non-normative as opposed to normative life events and transitions (Wrosch & Freund, 2001). Additionally, non-normative events may be related to different opportunity structures for development in different groups of individuals (i.e., life-stage principle; Elder, 1974).

Deregulation of the Life Course

In recent decades, there has been a vigorous debate over the structure of the life course and questions of standardization, individualization, and differentiation (for an overview, see Macmillan, 2005). It has been argued that the variation in life course patterns was increasingly eroded through the expansion of state activities and the ever-increasing institutionalization of social life through the 19th and 20th century (e.g., Meyer, 1986). This is in line with evidence for a continuation of an institutionalized model of the life course (e.g., Lengerer & Klein, 2007),

suggesting that age-normative goal striving is still important for personal development. This might be the case for at least two reasons: First, fundamental factors of development, such as biological factors, are stable and correlated with chronological age (Baltes, 1987). Second, some developmental goals are much more likely to be timed after the achievement of other goals (e.g., finding a romantic partner first and then start a family). From this perspective, developmental goals cannot be easily reversed, such that their age-sequential structure is fairly resistant to change (Wrosch & Freund, 2001).

However, the literature has also pointed to changes in the socio-structural conditions that have caused a shift from an institutionalized life course to processes of destandardization and deregulation of the life course (e.g., Held, 1986). While individuals are still subject to cultural and institutional constraints, such constraints seem to be more varied, more diffuse, and less universal, thereby rendering the life course less uniform (e.g., Shanahan, 2000). As associations between age and the timing of events have weakened, deviations from normative transitions and events probably occur more frequently and affect more people (e.g., Wrosch & Freund, 2001). Age ranges in which developmental goals have to be solved have broadened (Zepelin, Sills, & Heath, 1987) and a restructuring of adult life has been evident in domains such as family and work (e.g., Held, 1986). These tendencies for destandardization and deregulation of the life course provide both opportunities and challenges for individuals' development. For example, in affluent societies, opportunities have emerged in the form of gains in individual freedom to strive for individualistic and self-adapted goals (e.g., self-actualization) and postpone specific life tasks (e.g., having children). In contrast, new challenges have arisen because historical change has produced new, normatively less expected life changes or tasks such as cyclical unemployment and an increasing number of divorces.

Thus, in summary, individuals have to master both normative and non-normative developmental demands (for a table with prototypical developmental tasks, see Hutteman, Hennecke, Orth, Reitz, & Specht, 2014). As Macmillan (2005) concludes, the contemporary life course is probably both highly structured and standardized, but also variable and destandardized (cf. Settersten, 2003). Following this assessment, we assume that, at least in some regards, the normativity of life course patterns may be relatively less pronounced than in historically earlier times. It has been argued that this requires people to play a more active role and show higher self-regulatory skills to compensate for the lack of social structuring and normative orientation (Freund, Nikitin, & Ritter, 2009).

The Need for Self-Regulation

Self-regulation refers to the capacity to plan, guide, and monitor goal-directed behavior (including thoughts, emotions, and actions) flexibly over time and across changing circumstances (Brown, 1998; Wrosch & Freund, 2001). Goals, in turn, direct behavior and development into particular pathways (J. Heckhausen, 1999). Within the given structure of opportunities and constraints, people who select age-appropriate goals, invest effort in attaining developmental goals, and are able to restructure no longer achievable goals, can be expected to develop positively (J. Heckhausen, 1999). However, in light of the less normatively structured life course, people are confronted with different challenges: They are not only forced to select *which* goals to pursue, which to maintain in the face of obstacles or losses, and which goals to abandon; they also have to decide *when* and *how* to pursue selected goals. In this regard, successful development necessitates the selection and combination of multiple life-goals into a coherent and consistent goal hierarchy as well as the successful management of challenges posed by the pursuit of multiple goals (Wrosch & Freund, 2001).

People who significantly delay the pursuit of important developmental goals may face difficulties that have severe negative consequences for their further development. For instance, if young adults postpone their education in order to work in a low-skill job, they might earn money right away but have a hard time to get an education later on. Getting back to school after years of working requires higher self-regulatory skills as social and institutional support are lower than for young adults. In other words, the less strong the age-related expectations and regulations regarding the timing of certain developmental goals, the more likely it may be that people delay their pursuit. In the following, we investigate how the relative loosening of the structure of the life course affects procrastination of important developmental goals. Moreover, we will elaborate on mechanisms that might contribute to age-related differences in procrastination, and propose research questions for future research. Let us first introduce the concept of procrastination more fully.

Procrastination

Procrastination has been defined as the voluntary delay "of an intended course of action despite expecting to be worse off for the delay" (Steel, 2007, p. 66). The expectation of being worse off is often accompanied by discomfort (e.g., Solomon & Rothblum, 1984), resulting from a certain type of goal conflict, namely of not acting in accordance with one's goal hierarchy. To stay with the previous example, the term procrastination does not apply when young adults have to postpone higher education because they cannot afford it or when they believe that getting a degree later is just as possible and desirable as getting a degree now. However, is it considered procrastination when higher education is a top-priority goal of a person, he or she has the intention to get the degree now and has the opportunity to attend an appropriate college, but instead continues to work in a coffee shop and hang out with friends, knowing full well that this

is not the most important goal at this time. In other words: Procrastination involves putting things off, but not all instances of putting things off amount to procrastination. In order to count as procrastination, a person has to perceive a certain degree of autonomy in when to pursue the goal in question (i.e., the delay is not dictated by external circumstances), be able to act upon the goal, and the person must perceive the delay as undesirable (Tappolet, 2010). To our knowledge, the concept of procrastination has not yet been applied to developmental goals.

More Freedom, More Choices – More Procrastination?

The idea that autonomy may sometimes be experienced as a burden is not new. For example, according to the existentialist philosopher Jean-Paul Sartre (1948) humans are "doomed to freedom," and this freedom may be overwhelming. Due to globalization and the resulting increase in options available to individuals during their life course, this experience might even be enhanced (Freund et al., 2009). For instance, college students in general have a great deal of choice and flexibility regarding their education: They can study in different countries, begin college right after graduation from high school or at some later time, enroll in courses continuously or take classes on an alternative timeline, and enroll full-time or part-time (Arnett, 2004). As Arnett notes, with no one around to exercise control on their behalf, some students' self-regulation abilities prove to be inadequate to handle the freedom and challenges of college life.

Silver (1974) suggested that one predictor of procrastination is the number of choices people have to take when pursuing a goal: The more junctures that require choice or the higher the number of possible paths one might follow, the more likely is procrastination (see also Steel, 2007). This might be particularly relevant during transition periods (e.g., when becoming independent from parents in young adulthood) and in relatively ill-structured contexts (e.g.,

retirement). Because new habits have not yet been formed, people may need to make more decisions and thus procrastinate more. Closely tied to this is the issue of uncertainty: In the absence of normative orientation, people may be uncertain about whether they are striving for appropriate goals, the usefulness of specific means, and the effort they need to invest for goal attainment (Wrosch & Freund, 2001). Procrastination is particularly likely when people have not acquired strategies needed for successful goal realization (e.g., strategies to combat stressors) and experience high uncertainty regarding the requirements of a task and how to go about it (e.g., Fischer, 2001). Thus, together with the assumption that nowadays people have to make more decisions with regard to which goals they can and want to realize at what point in time, we pose the following first set of questions that might guide future research on procrastination in a lifespan approach: *1. Which developmental goals are less strongly regulated, resulting in higher autonomy regarding the timing and way of pursuing them? How does this affect procrastination of these goals?*

Procrastination as a Sample Case for Late-Life Gains in Self-Regulation

Above, we have stated that today people face fewer normative events and, as result, need more self-regulatory skills to avoid procrastination. In addition, we posit that the need for self-regulation also increases across adulthood. Historically speaking, growing older is a relatively new phenomenon. The social structures to support the life management of older individuals have lagged behind (Riley, Kahn, Foner, & Mack, 1994). Existing normative timetables become more blurred and there are less pronounced sociocultural "scripts" and expectations in older adulthood (e.g., Settersten & Hagestad, 1996a, 1996b). This, in turn, places greater weight on older adults' self-regulation, i.e. they have to select, pursue, and disengage from personal goals in a relatively self-structured and self-directed manner (Wrosch & Freund, 2001).

Part V

Does the higher need for self-regulation in older age lead to more procrastination in older adults? Research on age-related differences in procrastination is scarce, but the existing evidence does not support this idea. On the contrary, procrastination seems to decrease with age (Díaz-Morales, Cohen, & Ferrari, 2008; Gupta, Hershey, & Gaur, 2012; Steel, 2007; Steel & Ferrari, 2013). Hence, one could consider the decreasing procrastination as a sample case of gains in self-regulation across adulthood. For instance, as we grow older, some facets of conscientiousness increase (J. J. Jackson et al., 2009), a trait negatively related to procrastination (e.g., Steel, 2007). People are also likely to broaden their repertoire of self-regulation strategies over the lifespan. However, the underlying developmental processes are not yet well understood and require integration with findings of late adulthood declines in various functional domains. For instance, aging disproportionately affects frontal lobe structures, which are vital for executive functioning (e.g., Pfefferbaum, Adalsteinsson, & Sullivan, 2005). Executive dysfunction, in turn, is predictive of procrastination (Rabin, Fogel, & Nutter-Upham, 2011; Stolcis & McCown, 2017). The resulting research question is: *2. What are the developmental processes that contribute to age-related differences in procrastination?*

In this context, it is worth noting that there is a substantial correlation between procrastination and goal-management failures in everyday life, which seems in part due to shared genetic influences that also explain substantial variation in impulsivity and executive functions (e.g., Gustavson, Miyake, Hewitt, & Friedman, 2015). However, despite the interconnectedness of procrastination and goal-management abilities, there may be substantial intraindividual variation in procrastination across the lifespan. Given the importance of self-regulation for successful goal pursuit, a developmental approach to procrastination raises the question of which developmental goals might be related to procrastination. For instance, having a child places high

demands on the parents' time and cuts into how much sleep they will get. Parents deprived of sleep are likely to experience reductions in executive functions which, in turn may result in impulsive decisions (Wagner, Barnes, Lim, & Ferris, 2012) and procrastination.

Multiple Goal Pursuit and Motivational Conflict

Adult development is characterized by higher levels of motivational competence: For instance, older adults report less conflict and more facilitation between their personal goals than younger adults (for a review, see Riediger, 2007). Goal conflict occurs when the pursuit of one goal (i.e., climbing the career ladder) impairs the likelihood of success in reaching another goal (i.e., starting a family). Accordingly, multiple goal pursuit often requires a dynamic balance between opposing demands for limited resources, such as energy and time, to ensure that moving toward one of the goals does not move people away from another one. In contrast, goal facilitation emerges when the pursuit of one goal simultaneously increases the likelihood of success in reaching another goal. For example, studying at a university may help both to further one's future career and to get to know a romantic partner. Lower goal conflict and higher facilitation are related to higher goal involvement and emotional well-being (e.g., Riediger & Freund, 2008).

As elaborated above, procrastination can be considered a particular type of goal conflict, resulting from not acting in accordance with one's goal hierarchy. Therefore, it is not surprising that procrastination is associated with distress and negative mood states such as depression and anxiety (e.g., G. L. Flett et al., 2012; Senécal et al., 1995). Compared to people who do not procrastinate, people who do procrastinate report greater feelings of regret in domains of education pursuits, parenting, family and friend interactions, health and wellness, and financial planning (Ferrari, Barnes, & Steel, 2009). Of particular relevance in this context, Riediger and

Freund (2008) found that older adults report fewer "should" conflicts, which emerge when being engaged in an activity while being aware that one should be doing something else instead. Feeling that one should be doing something different and the accompanying feelings of guilt or shame are also characteristic of procrastination (Blunt & Pychyl, 2005; Fee & Tangney, 2000).

One may speculate that older adults have a lifelong experience with encountering and mastering intraindividual motivational conflicts. For example, for older adults it seems easier than for younger to give up a behavioral tendency when it conflicts with another one, resulting in lower perceived conflict in the long run (see Riediger & Freund, 2008). Furthermore, when procrastinating, older adults may engage in activities that, for example, are perceived as being more similar to the procrastinated target activity. This, in turn, might decrease goal conflict in older adulthood. Regardless of the specific mechanisms, the third research question we propose is: *3. Is the decline in motivational conflicts over the lifespan associated with a decline in procrastination?*

Effects of Time Perspective and Longer Life Expectancy on Procrastination

The concept of time is crucial in the context of both human development (e.g., Carstensen, 1991) and procrastination (Díaz-Morales & Ferrari, 2015). Socioemotional selectivity theory (Carstensen, 1991) suggests that people monitor how much time they have left in life. Whereas young adults are more likely to perceive that they have plenty of opportunities in the years ahead and plenty of time to pursue them, older adults are more likely to feel that time is running out and perceive their future options as more limited. Although goal content changes over the lifespan (see Freund & Riediger, 2006) and procrastination manifests itself differently in younger and older adults (see Stolcis & McCown, 2017), consequences of lost opportunities may generally become increasingly salient and irredeemable with age. For instance, when young

adults fail to submit their bachelor's thesis on time, this can have serious consequences as they may fail their degree. However, often they can still make up for the shortfalls (e.g., submit the thesis a semester later) or find alternative career paths (e.g., start a computer company). In contrast, when older adults engage in procrastination (e.g., putting off medical checkups or picking up prescription medications), this can have much more serious consequences. Older adults may also experience more severe consequences because negative effects of procrastination may accumulate across adulthood. That is, failing to accomplish a developmental task (e.g., completing education) has immediate negative consequences (e.g., lower subjective well-being). However, given the age-sequential structure of developmental tasks, early failures can make it impossible to achieve subsequent tasks (e.g., reaching satisfactory performance in one's career), which, eventually, may create a heavy burden in old age (e.g., poverty after retirement). Research is needed to investigate age-differential short- and long-term effects of procrastination on outcomes ranging from personal (e.g., subjective well-being) to societal levels (e.g., public health costs).

Notwithstanding the concrete consequences that procrastination has in different age groups, the question arises whether the increase in life expectancy over the past decades results in longer time periods during which certain goals can be pursued. Freund and colleagues (2009) have argued that knowing that certain goals *can* be postponed until a later time might result in the perception that they *should* be postponed. As a consequence, people might concentrate on goals that cannot be postponed during young and middle adulthood such as establishing a career, while family-related transitions (e.g., getting married) are postponed more and more until later years, when certain career-related goals have been achieved. Paradoxically, then, due to an increased life expectancy, timetables may become stricter for younger adults and social

expectations even stronger with regard to the kind of goals they should pursue and when they should achieve them. The higher pressure to pursue and reach certain goals, in turn, might increase fear of failure (Elliot & Church, 1997), which predicts procrastination (Steel, 2007). Thus, we suggest the following set of research questions: *4. Does the possibility that certain goals can be postponed until a later time result in the perception that they should be postponed? How does this affect different predictors (e.g., high expectations) of procrastination in people's present goal pursuit?*

Note that this research question does not necessarily contradict the first proposed set of research questions. People may experience more autonomy regarding some developmental goals but stronger social expectations for other goals. Both processes may lead to procrastination.

What about the should-goals that people postpone? Thinking that certain goals *should* be postponed because they *can* be postponed does not qualify as procrastination. That is, when people believe that certain goals *should* be postponed, it can be reasonable to postpone them. Procrastination occurs when knowing that certain goals can be postponed results in their postponement despite the "self-acknowledged best reason in favor of doing something today" (MacIntosh, 2010, p. 68). Certain instances of postponing family-related transitions such as having one's first child may be an example of procrastination in this regard. Having a child is a common developmental goal (e.g., Havighurst, 1952) that is more and more delayed. For instance, in Switzerland, the number of births to mothers older than 34 years has tripled in the past 30 years (Swiss Federal Statistics Office, 2017). Among other factors, women's education, employment, and career orientation are important factors that contribute to later childbearing (see Kreyenfeld, 2010). Many educated women postpone childbearing despite the knowledge of the declining fecundity (Eriksson, Larsson, & Tydén, 2012). As a consequence, they may end up

either childless or with fewer children than they desire. Again, if postponement of parenthood is to count as procrastination, a couple has to postpone parenthood despite the goal to have a child now (e.g., within the time frame of one year) and expecting potential negative consequences of the delay (e.g., declining fecundity) that outweigh the positive consequences of delay (e.g., climbing the career ladder). That is, the couple must not feel forced, for example by external circumstances such as employment demands, to not have a child now. In those couples, it would be interesting to study whether the postponement is driven by the knowledge that they *can* (but do not think it reasonable to) postpone this developmental goal. In general, it would be very interesting to compare systematically the downstream psychological and social consequences of forced or intended postponement and procrastination.

As is true for everyday procrastination (i.e., watching YouTube videos instead of working), preference reversals may also occur for developmental tasks. That is, people may not act in accordance with their long-term interests (i.e., having a child) but accomplish immediate goals (i.e., travel the world). Evidence supports the assumption of preference reversals also in such long-term goals: Whereas older surveys found no relationship between family size and procrastination (Ferrari et al., 2009; Harriott & Ferrari, 1996), evidence from a more recent large cross-sectional study shows that procrastination is negatively related to family size (Steel & Ferrari, 2013). However, the study could not identify if people who tend to procrastinate also tend to put off having children or if they simply have fewer of them.

The example of childbearing points to a potentially relevant distinction in the study of procrastination: In contrast to the phenomena that are typically in the focus of procrastination research (i.e., educational goals), developmental goals may have deadlines that are much more vague or that represent age-normative constraints. In the example of parenthood, the biological

deadline is relatively strict (although it becomes more relaxed due to medical innovations in assisted reproductive technology). This raises the following more general questions: 5. *Do the mechanisms that underlie procrastination of everyday tasks also apply to developmental goals? Is procrastination of developmental goals experienced differently?*

Goal Focus and Procrastination

A more recent series of studies in the research on successful goal pursuit has focused on the role of goal focus (for an overview, see Kaftan & Freund, 2018b). Goals encompass the cognitive representations of desired outcome states and the means that are functional for attaining them (Kruglanski et al., 2002). Based on this definition, goal focus refers to the extent to which a person focuses on these outcome states or the means at any given time. A process focus denotes the higher salience of the means of goal pursuit (i.e., the 'how' of goal pursuit), whereas an outcome focus refers to a higher salience of the desired outcomes of goal attainment (i.e., the 'why' of goal pursuit). For example, when pursuing the goal of finding a partner, people might think primarily about where to meet a potential partner and how to best approach him or her (i.e., process focus), or focus primarily on how happy they would feel in a fulfilling relationship (i.e., outcome focus).

Usually, the developmental goals of younger adults have an inherent outcome focus (i.e., receive a college degree). During middle adulthood and into old age, goals shift from attaining new and better outcomes to maintaining one's health, cognitive and physical functioning, as well as close social relationships, and to avoiding losses in these domains. This shift in goal orientation from achieving gains to maintenance and the avoidance of losses fosters a shift from focusing on outcomes of goal attainment to a stronger focus on the process of goal pursuit (see Freund et al., in press).

Recent evidence suggests that focusing more on the means of goal pursuit (i.e., adopting a process focus) is more beneficial for goal progress and subjective well-being than focusing more on its ends (i.e., adopting an outcome focus). In addition, first empirical evidence indicates that adopting a process focus is adaptive to overcome procrastination (for an overview, see Kaftan & Freund, 2018b). Linking these two findings, we maintain that age-related declines in procrastination may be due to the shift from outcome to process focus. Accordingly, we propose the following research question: 6. *How is goal focus related to age-related differences in procrastination?*

Methodological Considerations

Overall, the issues discussed in this article illustrate that procrastination research can profit from a developmental perspective. Moreover, a comprehensive understanding of procrastination needs to extend its focus beyond academic procrastination and include other (and changing) contexts. We have pointed out that the strength of social expectations and norms influences the structure of age-related opportunities and constraints, which might be highly relevant to the procrastination of important developmental goals.

One of the key methodological issues plaguing current procrastination research is the strong reliance on cross-sectional studies. These studies are based on the assumption that procrastination is a relatively stable trait-like personal attribute. However, several studies indicate that procrastination is a less set and more malleable characteristic way of behaving (see Sirois & Pychyl, 2016). Thus, longitudinal research is urgently needed. Cross-sequential designs would be ideal to investigate the development of procrastination across the lifespan as they allow the disentanglement of age and cohort effects. However, such studies are very resource intensive and thus rare.

Intervention studies targeting different factors affecting procrastination offer another possibility to investigate adult age differences in procrastination. If more self-regulation is needed over the lifespan, older adults should profit more than younger adults from such an intervention and, hence, procrastinate less. In contrast, given the evidence that older adults procrastinate less, younger adults might profit more from such interventions. Similarly, one might experimentally manipulate such factors as the perceived urgency to pursue a certain developmental goal by pointing to the time windows for goal pursuit. Do people procrastinate less when they perceive more urgency?

Studies with a stronger temporal focus, such as experience sampling or diary studies, are particularly well suited to investigate procrastination in adults' everyday lives. Such studies enable a better understanding of the processes underlying procrastination as they unfold in people's lives. For example, research has primarily focused on single-goal situations, but it is increasingly recognized that managing multiple goals is the norm rather than the exception (e.g., Riediger, 2007). Findings from single goal research cannot be easily generalized to the pursuit of multiple goals. Experience sampling studies could be used to examine the dynamics of goal relations in different age groups and their associations with procrastination over time.

Conclusion

A developmental approach emphasizes not only *what* life events occur but also *when* (i.e., on-time vs. off-time) they occur and to what extent humans anticipate and are prepared for particular events through prior socialization. On the basis of the proposed destandardization and deregulation of the life course and due to increased life expectancy, we have argued that people face multiple challenges that require a high level of self-regulation. When self-regulation fails, people may behave in self-defeating ways, of which one is procrastination. Despite the age-

related decline of procrastination, delaying important goals is a problem familiar to people of all ages. We have touched upon several challenges that people face across adulthood and pointed to possible mechanisms underlying adult age differences in procrastination. We hope that the lifespan approach to procrastination will extend to younger age groups (children, adolescents) and advance both, the understanding of procrastination as well as the understanding of how people develop across the lifespan.

OVERALL DISCUSSION

The present thesis has addressed four major topics: the adaptiveness of process and outcome focus during goal striving and their links to procrastination (Parts I and II), the effects of process and outcome focus on the evaluation of alternative activities (Part III), the development of process and outcome focus over time (Parts IV), and a contemporary view on procrastination from a lifespan perspective (Part V). In the overall discussion, I first briefly summarize and integrate the most important findings and theoretical points. Thereafter, I discuss the findings and contributions with regard to their theoretical implications and make suggestions for future research. Finally, I propose practical implications of the results and draw final conclusions.

Summary and Integration of the Main Findings

Part I introduced the concept of goal focus and extensively reviewed the empirical evidence on the role of goal focus for successful goal pursuit and subjective well-being. Overall, prior research suggests that focusing on the means of goal pursuit (i.e., adopting a process focus) is more beneficial for goal progress and subjective well-being than focusing on its ends (i.e., adopting an outcome focus). However, we also discussed possible circumstances under which an outcome focus may be more adaptive (e.g., when a task is easy to master). In doing so, we covered both goal pursuit in general and procrastination in particular. Given that procrastination hinders successful goal pursuit and lowers subjective well-being, Part I ended with highlighting the importance of goal focus for understanding how people best pursue their goals.

Part II investigated how goal focus is related to procrastination in the sports domain. Both a higher process and outcome focus on the current activity decreased the likelihood that people procrastinated at times they had planned to work out. However, only average process focus was

related to the total number of procrastination episodes at the end of the study: The higher their average process focus, the less people procrastinated during the study. Moreover, while procrastinating, people showed a stronger intention to start with the workout when they were focusing more on the process of what they were currently doing. This effect was attenuated by a higher outcome focus. Furthermore, the longitudinal experience sampling design allowed us to examine how goal focus is related to both short- and long-term indicators of successful goal pursuit and achievement when people acted on their intention to work out. The study consistently showed that adopting a process focus was adaptive both at a proximal level (e.g., regarding mood, motivation, and the perceived pleasantness of the workout) and distal level (i.e., regarding workout satisfaction, achievement of personal goals, and objective improvement). In contrast, the results regarding outcome focus were more mixed: Adopting an outcome focus had some immediate benefits (e.g., particularly regarding motivation and perceived importance of the workout), but was not related to the overall measures (i.e., number of workout sessions, goal achievement, and overall workout satisfaction).

Part III tested the hypothesis that goal focus is associated with how students evaluate activities they engage in during procrastination episodes (i.e., alternative activities) in absolute terms and compared with how they evaluate the same activities when they do not procrastinate. In addition, we investigated the influence of goal focus on evaluations of the alternative activities relative to the evaluations of the procrastinated bachelor's thesis (i.e., the focal activity). We found support for our main hypothesis that focusing on the outcome of alternative activities is more strongly related to the evaluation of alternative activities than process focus. Outcome focus was positively related to importance and stress, and negatively to pleasantness, guilt, and motivation. In contrast, process focus was positively associated with pleasantness and

motivation, and negatively with guilt. While students perceived alternative activities as rewarding at a later point in time when they focused more on the outcome, they perceived these activities as more immediately gratifying when they focused more on the process.

Part IV investigated how process and outcome focus change over the course of long-term goal pursuits (i.e., exercising regularly and writing a thesis). The main finding was that with an approaching deadline for the focal activity, people focused more on the outcome of both the focal and alternative activity. That is, although alternative activities listed by participants (e.g., cleaning, relaxing, etc.) were not likely to involve deadlines that are co-approaching with the deadline of the focal activity, people also focused more on the outcomes of alternative activities over time. Furthermore, the time courses of process focus differed for the two types of focal goals: Whereas process focus decreased over time for a highly repetitive set of goal-relevant activities (i.e., workout), it remained stable for a complex array of goal-relevant means (i.e., working on a bachelor's thesis).

Finally, Part V elaborated on procrastination from a motivational lifespan perspective, focusing on adulthood. On the basis of the assumption of a deregulation and individualization of the life course over historical time (e.g., Macmillan, 2005), we argued that people nowadays face multiple challenges that require a high level of self-regulation. When self-regulation fails, people may behave in self-defeating ways, one of which is procrastination. Regarding age differences, first empirical evidence suggests that older adults procrastinate less than younger adults. We elaborated on potential mechanisms (e.g., decline in motivational conflicts) that might explain these age differences, addressed contextual influences (e.g., the extent of [de]regulation), and derived potential research questions that could guide future research. Part V ended with some methodological considerations: We stressed the need for more longitudinal studies and studies

with a temporal focus, such as experience sampling, to meet the conceptualization of procrastination and its antecedents as dynamic constructs. In addition, we recommended that these methods should be complemented with experimental studies, manipulating factors relevant to procrastination (e.g., perceived urgency).

Based on the empirical parts of this dissertation, the following four conclusions can be drawn: First, process focus is negatively associated with procrastination and positively associated with different indicators of successful goal pursuit. Second, outcome focus is adaptive (alone or in combination with process focus) regarding some outcomes, but irrelevant or even maladaptive regarding others. Third, goal focus is associated with absolute and relative evaluations of the activities people engage in while procrastinating. Fourth, goal focus changes with an approaching deadline in both situations when people pursue focal and alternative goals (i.e., when they procrastinate), and the trajectory of goal focus regarding focal goals is moderated by the type of goal-related activity (i.e., repetitive vs. non-repetitive).

Mechanisms of the Adaptiveness of Process and Outcome Focus

Theoretical accounts pertaining to the role of goal focus for successful goal pursuit suggest that, depending on various internal and external factors, both process and outcome focus may be (mal)adaptive (see Freund & Hennecke, 2015; Krause & Freund, 2014b). However, using various study designs and operationalization of goal focus, prior research has provided converging evidence for the relative adaptiveness of process over outcome focus (Introduction and Part I).

The current dissertation adds to this evidence by showing that a process (vs. outcome) focus is more strongly linked to different short-term and long-term indicators of successful goal pursuit. Moreover, a process focus also seems adaptive when people procrastinate (Part II).

However, Part II also provided some evidence for the adaptiveness of outcome focus. For example, outcome focus was positively related to motivation during the workout. How can these findings be interpreted from a broader perspective and what do they suggest for future research?

Intrinsic and Extrinsic Motivation

Our results can be interpreted as being consistent with research on intrinsic and extrinsic motivation (Deci, Koestner, & Ryan, 1999; Ryan, Sheldon, Kasser, & Deci, 1996). At first glance, the definition of intrinsic and extrinsic motivation resembles process and outcome focus: Intrinsic motivation entails a focus on the process, whereas extrinsic motivation entails a focus on the consequences of attaining a certain outcome (Part I). As compared to extrinsic motivation, intrinsic motivation is associated with less procrastination, deeper engagement in activities, better performance, and higher persistence (e.g., Grund & Fries, 2018; Vansteenkiste, Lens, & Deci, 2006; Woolley & Fishbach, 2017). However, extrinsic motivation can have immediate benefits as well (e.g., increased effort; Bénabou & Tirole, 2003). This may help explain why outcome focus was positively related to current motivation, but largely unrelated to long-term outcomes (i.e., number of workout sessions, goal achievement, and overall workout satisfaction; see also Freund et al., 2010). Note, however, the differences between goal focus and intrinsic/extrinsic motivation that we described in Part I. Future research should test the incremental predictive ability of process and outcome focus over and above intrinsic/extrinsic motivation.

Pleasantness, Difficulty, and Flow

In contrast to outcome focus, which only had some benefits in the short run, process focus was adaptive both in the short and the long run (Part II). In Parts I and II, we described different mechanisms explaining why this may be the case. For example, in line with Krause and

Freund (2016), we found that process focus on the focal activity is positively associated with pleasantness. Higher pleasantness, in turn, may help explain why people with a higher process focus also worked out more often and achieved better outcomes. One of the underlying mechanisms may be that people do not have to delay gratification when perceiving the focal activity as pleasant (Mischel, 1996; Mischel, Shoda, & Rodriguez, 1989). In Part I, we described that people typically spend more time on pursuing their goals than experiencing their attainment (see also S. Frederick & Loewenstein, 1999). Accordingly, being able to enjoy the path towards goal attainment should protect people from succumbing to short-term temptations that are in conflict with the long-term gratification involved in outcome attainment. In other words, focusing on the process of goal pursuit should require less self-regulation than pursuing goals with an outcome focus (see also Woolley & Fishbach, 2017). However, it should be mentioned that the positive relationship between process focus and pleasantness of the focal activity as well as process focus and mood (Part II) deviate from the finding of Freund and Hennecke (2012) that goal focus is not directly associated with affective well-being. The diverging results may be due to different assessment methods. In our study, participants rated their mood at the end of the individual workout windows. In Freund and Hennecke's study, participants rated their mood retrospectively for the past week. Retrospective self-reports require that respondents integrate information from memory and may be biased by a variety of recall biases. This applies in particular if mood is highly variable over time because specific instances of the experience will be more difficult to recall accurately. As a consequence, there is usually low to modest agreement between retrospective and momentary assessments of mood (Solhan, Trull, Jahng, & Wood, 2009).

What is particularly noticeable in Part II is a more detailed inspection of interindividual differences in intraindividual relationships, showing that the positive association between process focus and perceived pleasantness applies to most individuals. This is a relevant finding because theoretical accounts (e.g., Krause & Freund, 2014b) have suggested that when people are engaged in an unpleasant focal task, focusing on the process of goal pursuit should increase the likelihood of procrastination. This theorizing fits well with the finding that people want to avoid emotional distress caused by the focal task and, thus, engage in enjoyable alternative activities (e.g., Tice, Bratslavsky, & Baumeister, 2001; cf. Schödl, Raz, & Kluger, 2018, for preventive effects of avoidance motivation on procrastination). In contrast, our analysis suggests that individuals who generally perceive the focal activity as relatively aversive can benefit from adopting a process focus as well (see also Krause & Freund, 2016). How is it possible that focusing more on the process of an aversive activity makes it more pleasant? One explanation can be derived from the theory of flow (Csikszentmihalyi, 1990). A central tenet of this theory is that people experience flow when challenges are in balance with skills. Hence, it may be that people who do *not* focus on how to do the exercises (i.e., low process focus) experience the workout as aversive because they think that they lack the necessary skills. However, once they attend to a subset of actions that are smaller in scale and more manageable (i.e., high process focus), they are more likely to be successful (see also Zimmerman & Kitsantas, 1997, 1999), which may establish a match between perceived challenges and skills. This reasoning is in line with both Action Identification Theory (Vallacher & Wegner, 1987, 1989) and Control Theory (Carver & Scheier, 1998). These theories posit that people should lower their level of attention (i.e., think about a task at a more specific level) and focus more concretely on solving momentary problems when the action is perceived as difficult (see also Locke & Latham, 2002).

In support of this proposition, Part II showed that people perceive the focal activity as less difficult when they focus more on the process. The reduced difficulty may help explain why people enjoyed the workout more, worked out more (i.e., procrastinated less) and achieved better long-term outcomes (Part II).

Although process focus was negatively linked to the perceived difficulty of the focal activity, it is probable that there are boundary conditions regarding the adaptiveness of process focus. If a task is easy to master, it might be more adaptive to focus on the outcome. By focusing on the outcome, people can better appreciate and consolidate their reasons for striving, which may then re-energize them towards the goal (Ferguson & Sheldon, 2010; Houser-Marko & Sheldon, 2008; Vallacher & Wegner, 1989; Vallacher et al., 1989). Thus, if people perceive activities as easier when they focus more on the process, the perceived difficulty may reach a threshold at which it would be more adaptive to focus less on the process and more on the outcome. An experimental manipulation of task difficulty and goal focus may provide valuable insights with regard to where this threshold may lie and whether it is stable or malleable.

Given the relations between process focus, task pleasantness, and task difficulty, empirical work is also needed to investigate circumstances under which focusing on the process is experienced qualitatively similarly to flow (Csikszentmihalyi, 1990). This question may become less relevant with respect to alternative activities (Part III) because it is hard to imagine that there is a perceived balance between challenges and skills during a typical procrastination activity, such as surfing the Internet. In the procrastination context, our understanding of "being lost in the alternative activity" refers to how absorbed people are in the alternative activity (i.e., "mindless procrastination," Kroese et al., 2016, p. 101), without the alternative activity

necessarily posing challenges that match skills. However, it is necessary to test if, indeed, people are more likely to experience flow when engaged in focal rather than alternative activities.

Process Focus: A Less Judgmental Way of Focusing?

One may argue that aversiveness is only a "second-order phenomenon" not tied to the activity itself but related to evaluative thoughts a person has about an activity. For example, a person that experiences working out as boring may do so because he or she is somewhat distracted or experiences it as too monotonous. This is the actor's evaluation and not the nature of the activity itself. Hence, a person that focuses more on the process of doing the activity (e.g., "I'm slowly lifting the weight."), may pass the stage of evaluation and judgment, and "break through" the aversiveness. This is evocative of the concept of mindfulness. According to Noone and Hastings (2010), mindfulness is a non-judgmental attention to present-moment experiences. Mindfulness alters "the context with which … thoughts are experienced so they start to be seen as what they are, thoughts, … distinct from direct experience" (p. 71). It would be worthwhile, both from a theoretical and empirical standpoint, to systematically compare goal focus and mindfulness. For instance, is process focus a less judgmental, more mindful way of focusing on goal pursuit than outcome focus, and therefore more adaptive?

Sirois and Tosti (2012) found that procrastination is negatively associated with mindfulness. Moreover, several studies have found that procrastination is positively associated with a present-hedonistic and present-fatalistic time orientation (Ferrari & Díaz-Morales, 2007; T. Jackson, Fritch, Nagasaka, & Pope, 2003). Hence, the temporal focus of both people with a tendency to procrastinate as well as mindful people is the present. However, in the case of procrastination, the present focus does not appear to involve being truly present in the moment, and is therefore qualitatively distinct from the present focus of mindfulness. Sirois and Tosti

(2012) reasoned that people with a tendency to procrastinate are low in mindfulness because they display a need to avoid unpleasant thoughts and feelings, and engage in impulsive behaviors. These findings call for an exploration of whether there are different kinds of present-focused awareness associated with a process focus that differ in their adaptiveness (see also Borkovec, 2002).

Peculiarities of Certain Action Phases

On the basis of Helmke and Schrader's (2000) process model of procrastination, Krause and Freund (2014b; see also Freund et al., in press) presented a dynamic motivational framework centering on the role of goal focus for goal pursuit and procrastination. The present dissertation investigated different parts of the model proposed by Krause and Freund. Part II showed that during the actional phase of goal pursuit, a higher (vs. lower) process focus regarding the focal goal is more adaptive (see also Krause & Freund, 2016). In addition, in Part IV, we found that outcome focus regarding the focal activity increased with an approaching deadline. In contrast, process focus was stable when the focal activity involved engagement in different activities but decreased when the focal activity was repetitive. As a consequence of the different trajectories of the two foci, people focused equally on the process and outcome of the focal activity for most of the actional phase in the study on academic procrastination. Only when the deadline was close, the students focused somewhat more on the outcome than the process. In contrast, process focus was more pronounced than outcome focus during the entire actional phase in the workout study, although the discrepancy between the two foci decreased over time.

The higher relative degree of process focus at the beginning of goal pursuit in the workout study is in line with the findings of Heckhausen and Gollwitzer (1987) demonstrating that the post-decisional phase is associated with elaboration of plans and strategies of how to

implement goal pursuit (i.e., implemental mindset). In turn, thinking about the conditions under which the means of goal pursuit can be implemented (i.e., formulating implementation intentions) reduces procrastination (Wieber & Gollwitzer, 2010) and promotes successful goal attainment (e.g., Gollwitzer, 1993; Gollwitzer & Brandstätter, 1997). In contrast to positive fantasies about desired future outcomes (e.g., Oettingen & Mayer, 2002), implementation intentions are beneficial for goal pursuit because they focus attention on goal-relevant information, ward off distractions, and heighten the accessibility of situational cues. In addition, they make people optimistic about achieving the goal. This is compatible with our finding that process focus was positively related to the participants' confidence to achieve their workout-related goals, while outcome focus was not (Part II). Together with the negative relationship between process focus and the perceived difficulty of the focal activity (Part II), the higher confidence can be interpreted as supporting Krause and Freund's (2014b) proposition that adopting a process focus fosters self-efficacy beliefs (i.e., higher confidence) by rendering the task at-hand more manageable (i.e., lower difficulty; see also Bandura, 1977, for how mastery experiences reinforce a sense of self-efficacy). However, the positive effect of process focus might be limited to long-term goals that require maintenance of goal-relevant actions over an extended period of time. In this case, focusing on the activities related to goal pursuit can help maintain motivation even in the face of hindrances or setbacks (see Kuhl & Beckmann, 1994). In contrast, if the means of goal pursuit are well established and highly routinized, a strong process focus (and its confidence-boosting effects) may not be required and people might immediately proceed to implementing goal-relevant actions (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001).

This thesis focused on procrastination in the actional phase of H. Heckhausen's (1991) model of action phases, in which people put off the initiation or maintenance of a planned goal-relevant action (e.g., "I will work out four times a week"). However, procrastination can occur in different phases of goal pursuit (Blunt & Pychyl, 2000; Krause & Freund, 2014b). Future research may expand on our results and investigate the effects of goal focus in the context of procrastination of decision-making regarding whether or not to adopt a goal (e.g., "Should I start with a workout routine?"). A process focus (vs. outcome focus) might be less adaptive in action phases in which people set a goal (i.e., in the pre-decisional phase) or evaluate the means and the degree to which they reached the outcome (i.e., in the post-actional phase). For example, regarding goal setting, it should be beneficial to focus on the outcome (Freund et al., in press; Krause & Freund, 2014b) because it is necessary to compare both the desirability and attainability of different goals (i.e., adopting a deliberative mindset; e.g., Gollwitzer, Heckhausen, & Ratajczak, 1990). Investigating the role of goal focus in the context of decision-making is also relevant in light of the ongoing debate about whether decisional procrastination—a maladaptive pattern of postponing decisions—should be considered distinct from behavioral procrastination (Steel, 2010a; Tibbett & Ferrari, 2015). Tibbett and Ferrari (2015) argued that people with a tendency to procrastinate on making a choice between different goals consider everything that could possibly go wrong and become anxious. Accordingly, they refuse to make a decision, and do *not* act. In contrast, people who behaviorally procrastinate *do* act but they do not engage in tasks they consider most important. Investigating associations with the Big Five traits, Tibbett and Ferrari found that decisional procrastination is primarily linked to neuroticism, whereas behavioral procrastination is primarily linked to conscientiousness, despite the two types of procrastination being highly positively correlated. Based on these results, the authors argue

that these two types of procrastination are related but distinct. Future research may contribute to the debate on whether decisional procrastination is a unique type of procrastination by exploring the adaptiveness of process focus and outcome focus for decision-making in the context of goal pursuit (see also Thompson et al., 2009).

Finally, the models of Freund et al. (in press) and Krause and Freund (2014b) propose that people undergo a shift from process to outcome focus towards the end of the actional phase. In both longitudinal studies (Part IV), people focused more on the outcome of focal activities over time; however, in neither of the studies did they clearly focus more on the outcome than the process of the focal activity when the deadline was close. One possible explanation for this finding is that people are not willing to give up the benefits of focusing on the process they have experienced along the way (e.g., increased pleasantness; see above). This may be particularly true with regard to the pursuit of long-term goals that are subjectively important, which is likely reflected by a simultaneous process and outcome focus (Freund & Hennecke, 2012). Even though outcome focus was never more pronounced than process focus during the actional phase of goal pursuit in the workout study and only slightly more pronounced than process focus towards the end of the actional phase in the study with the bachelor students, process focus decreased for the repetitive activity of working out. Thus, whereas a strong process focus might make people perceive activities as less difficult and contribute to a routinization of behavior at first (Parts II and IV), a *strong* process focus seems no longer needed once actions are automatized (see also Zimmerman & Kitsantas, 1997, 1999). In contrast, with regard to the goal of writing a thesis, which necessitates a breadth of goal-relevant activities, process focus did not change (Part IV). For instance, by introducing performance measures during the pursuit of long-

term goals, future research may explore the moment-to-moment adaptiveness of the observed changes in goal focus.

A Two-Dimensional Conceptualization of Goal Focus

To ensure comparability, we used the same operationalization of goal focus in the two studies. However, it should be noted that prior research has also used different operationalizations and thus it is unclear whether alternative operationalizations would lead to the same conclusions.

One noteworthy difference is the operationalization of process and outcome focus as two separate dimensions versus opposite poles of one dimension. Previous research suggests that a single value for an individuals' relative process (vs. outcome) focus is able to predict successful goal pursuit and procrastination (e.g., Krause & Freund, 2016). However, such an operationalization levels out the main effects of outcome and process focus as separate variables that are likely positively related (e.g., Freund & Hennecke, 2012). The data presented in Part IV favors a two-dimensional conceptualization of goal focus: Process and outcome focus evolved asymmetrically over time. In addition, in both studies, there was a significant positive correlation between outcome and process focus during both non-procrastination and procrastination episodes. This positive association is consistent with goal system theory (Kruglanski et al., 2002), according to which activation within a goal system spreads from the outcomes to the means and vice versa. Freund and Hennecke (2012) suggested that people are likely to think a lot about both the process and the outcome of goal pursuit when a goal is subjectively very important. This is in accord with the significant positive association between the two foci and their positive relationship with the perceived importance of the workout in Part II. Based on our findings, future research may further investigate the adaptiveness of a simultaneous process and

outcome focus for goal pursuit. In doing so, future studies can build on existing theories that consider benefits of a high process *and* outcome focus. For instance, in his theory of action control, Kuhl (1985) describes why an action-oriented (vs. state-oriented) mode of control is adaptive for goal pursuit. An action-oriented person "focuses on a fully developed action structure" (p. 107). This fully developed action structure, in turn, includes that the person "focuses simultaneously on his or her present state, an intended future state, the discrepancy between future and present state, and action alternatives which may transform the present state into the desired future state" (Beckmann & Kuhl, 1984, p. 227). Similarly, according to Oettingen (1999; Oettingen & Mayer, 2002), an outcome focus may lead people to experience a necessity to act when the desired future is mentally contrasted with the impeding reality that needs to be changed. When a person's expectations of success are high, he or she will start to lay out the road to success (i.e., focus on the process), prepare for setbacks and hindrances, exert effort, and show persistence (see also Steel, Svartdal, Thundiyil, & Brothen, 2018).

Processes During Procrastination Episodes

According to Martin and colleagues (L. L. Martin & Tesser, 1996; L. L. Martin, Tesser, & McIntosh, 1993), thoughts concerning a goal that has not yet been achieved are powerful and persistent and enter consciousness even unintentionally until the goal is either met or abandoned (see also Zeigarnik, 1938). Such negative thoughts are also likely to intrude when people procrastinate (Bongers, Dijksterhuis, & Spears, 2010). For example, several studies have identified procrastinatory cognitions as a particular set of automatic, ruminative thoughts that underlie the negative mood linked to procrastination (A. L. Flett, Haghbin, & Pychyl, 2016; G. L. Flett et al., 2012; Stainton, Lay, & Flett, 2000). Characterized by self-blame and brooding over past procrastination, these thoughts can arise when it is difficult to complete aversive or

challenging tasks, which may increase stress and prompt procrastination (G. L. Flett et al., 2012; Stainton et al., 2000). However, to date, methodologically rigorous research on the processes involved in procrastination with a temporal focus, such as experience sampling, is largely lacking. A notable exception is a study conducted by Pychyl et al. (2000), which examined the ongoing ebb and flow of procrastination and affective correlates over a 5-day period in undergraduate students. Among other things, the study revealed that the relative pleasantness and difficulty of focal activities tends to shift depending on whether people are avoiding or engaged in these activities. Specifically, the study found that when people are avoiding a task, it is associated with negative appraisals (e.g., higher difficulty and lower enjoyment). However, once people engage in the same task, they appraise it more positively (e.g., lower difficulty and higher enjoyment). This dissertation, and especially Part III, took a different approach and focused primarily on alternative activities in which people engage while procrastinating, thus adding to the research aimed at better understanding the processes underlying and sustaining procrastination. How do our results relate to other findings and developments in the field?

A Reasoned Route Toward Self-Regulatory Failure?

Some prominent models of self-regulation distinguish two processes that determine behavior: a reflective or "cool" route that is directed by goals and long-term interests, and an impulsive or "hot" route that is oriented toward immediate pleasure (e.g., Metcalfe & Mischel, 1999; Strack & Deutsch, 2004). According to these dual process models, self-regulatory failure such as procrastination occurs when the impulsive system takes precedence over the reflective system, for example, because people are in "hot states" (e.g., experience fear of failure) that trigger hedonic orientations and inhibit long-term goals (Kroese et al., 2016).

However, recent research has challenged the idea that self-regulatory failure is only caused by impulsive processes as people may also use reason to justify "bad" behavior (De Witt Huberts et al., 2014). When people take this reasoned route to procrastination, they deliberately set aside their goals while relying on justifications that relieve them from feeling guilty (e.g., "I will not work out today because I need to tidy up my messy apartment now, but I will work out tomorrow."). In this case, putting off an intended behavior may function as a valid excuse for not doing it now (i.e., not going to the gym today does not feel like failure if the person plans to go tomorrow). Although procrastination does not necessarily rely on justifications, having a license may certainly foster procrastination (Kroese et al., 2016).

The results in Part III may be interpreted as adding support to this account of procrastination. Specifically, in Part III we argued that outcome focus may be linked to an increased awareness that one procrastinates. We argued that this awareness, in turn, might give rise to attempts to justify procrastination, which is more likely to represent the reasoned (vs. impulsive) account. In contrast, process focus might decrease the awareness of doing the wrong thing, which is more likely to represent the impulsive (vs. reasoned) account.

At the same time, some of our findings can hardly be integrated into a dual process model. For example, it is unclear how the weak to moderate positive correlation between process and outcome focus (Parts II, III, and IV) should be interpreted in this framework (i.e., to what extent is a mixture of impulsiveness and rationalization still a dual process?). On a more general level, an integration is even more problematic when assuming different underlying cognitive systems or processing in "two minds" as opposed to "simple" differences in cognitive salience of different aspects of goal pursuit to which the concept of goal focus refers (for more limitations of dual process models, see Fiedler & Hütter, 2014; Keren, 2013). Future research should therefore

test whether and to what extent an integration of goal focus into the framework of "hot" and "cold" cognitions as well as impulsive and deliberative routes to procrastination would be fruitful to better understand the processes underlying procrastination.

Freund and Hennecke (2012) speculated that people focus on both the process and outcome of goal pursuit if a goal is subjectively very important. Part II supports this assumption by showing that both process and outcome focus uniquely contribute to an increased perceived importance of the workout. However, in procrastination episodes (Part III), it was mainly outcome focus that was related to importance and process focus only somewhat reinforced this effect. Considering all activity characteristics, when people were engaged in goal-related activities such as working out (Part II), process and outcome focus had largely congruent effects on the immediate experience of the focal activity. In contrast, when people were engaged in alternative activities, process and outcome focus often had opposite effects (Part III). These opposite effects may be due to the irrationality of the delay. Anderson (2016) argued that people with a tendency to procrastinate have a complex awareness of the focal goal. They may pursue goals also with alternative activities while procrastinating, which, however, by definition, have a lower priority than the focal goal. As a consequence, people who procrastinate are nagged by a sense that they cannot legitimately defend putting things off. If they had no awareness of doing anything wrong (i.e., absence of a guilty mind or *mens rea*), then the term procrastination would not apply (Anderson, 2016). Given the requirement of a mens rea, they are conscious, at some level, of the commitment and the deadlines. Against this backdrop, one of the main challenges lies in finding a way to resist or block the temptation to ignore the evidence (e.g., how much time remains before a deadline). One way in which people deceive themselves about their transgression is by putting it out of mind, or letting it slip out of mind. Another way is to cherry-

pick the evidence and reason fallaciously about it (i.e., rationalize one's behavior; Anderson, 2016). These two ways are not necessarily contradictory. For instance, while watching TV instead of working out, a person might regulate his or her mood by closely following the plot of a movie and letting the scheduled workout temporarily slip out of mind (i.e., focus on the process). However, as soon as thoughts related to the workout intrude into consciousness, the person may engage in self-indulgent reconstruals of his or her procrastination (i.e., focus on the outcome). Consistent with this reasoning, we found that both a stronger process and outcome focus can reduce guilt independently of each other, although they are differentially related to various activity characteristics (Part III). Such a sequential account constitutes a possible alternative to the dual process model. Further research should explore this possibility and investigate to what extent process and outcome focus fluctuate within a single procrastination episode. In other words, how flexible are people in employing different strategies to sustain their procrastination? And how is this related to different affective processes and behavior?

The Dynamic Nature of Activity Characteristics

Previous research on procrastination (e.g., Tice et al., 2001) has largely focused on people's neglect of an aversive focal activity (e.g., practicing for a math test) and its replacement by an enjoyable alternative activity (e.g., reading an entertaining magazine). This focus is justified because procrastination is particularly susceptible to how unpleasant or aversive (e.g., boring, difficult, stressful, not intrinsically rewarding) people evaluate a focal activity relative to alternative activities (Blunt & Pychyl, 2000, 2005; Senécal, Lavoie, & Koestner, 1997; Tice et al., 2001). Unpleasant activities are likely to elicit negative emotions (for a review, see Sirois & Pychyl, 2013). As a consequence, engaging in enjoyable alternative activities can be interpreted as an attempt to regulate one's mood by escaping the negative affect or lack of immediate

positive rewards associated with the focal activity (e.g., Pychyl et al., 2000; Schouwenburg & Groenewoud, 2001; Sirois & Giguère, 2018). Although potentially effective in the short term, the preference for short-term mood regulation can have long-term costs that far outweigh and outlast the short-term gain in affect (Tice & Baumeister, 1997). This disqualifies procrastination as a reasonable mood regulation strategy (see Sirois, 2014b).

In contrast, some authors (e.g., Grund, Schmid, Klingsieck, & Fries, 2012; Perry, 2012; Silver & Sabini, 1981) have observed that people sometimes, rather than engaging in a pleasant alternative task, will perform a mildly aversive, perhaps even marginally useful, alternative task. Thus, a person who dislikes a particular household chore (i.e., doing the dishes) may put it off by doing some other chore, one that is somewhat less useful, but at the same time less unpleasant (e.g., organizing one's spice rack; Andreou, 2007; Heath & Anderson, 2010). As Sjöberg and Johnson (1978) pointed out, in many cases the temporary preference reversal is rationalized. This rationalization is easier to sustain if one engages in a mildly unpleasant (vs. straightforwardly pleasurable) task (Heath & Anderson, 2010). Moreover, getting other important tasks done may, at least partly, salvage both the person's image of self and emotions, for it leads to feelings of accomplishment and progress which fuel well-being (Deci & Ryan, 2000; Sheldon & Houser-Marko, 2001; Wiese, 2007). This reasoning is in accordance with the finding that people often report procrastinating on an activity because they had to do other important things (Klingsieck et al., 2013).

A central aim of this dissertation was to extend and qualify these findings. We assessed activity characteristics while participants were procrastinating and found that people's perceptions of activities change dynamically (see also Blunt & Pychyl, 2000; Pychyl et al., 2000). In Part III, we found that outcome focus is more strongly associated with the evaluations

of alternative activities than process focus. We argued that students are more likely to realize their procrastination when asking themselves why they are engaged in an alternative activity (i.e., when they adopt a higher outcome focus). This, in turn, should lead to substantial changes in the perception of these activities. In contrast, we assumed that focusing on the activity itself (i.e., a higher process focus) should allow people to better block out that they are procrastinating and thus "get lost" or "absorbed" (Sirois, 2014a, p. 30) in the alternative activity. By virtue of lowering the awareness of one's procrastination, focusing on the process of the alternative activity should lead to fewer changes, which was also confirmed. For instance, in Part III, we found that during procrastination episodes people on average perceive the alternative activities as significantly more negative (e.g., less pleasant) than when they do not procrastinate. This "tainting" effect was even more pronounced when they focused more on the outcome, suggesting that thoughts about what they were putting off continuously intrude. In contrast, a stronger process focus counteracted this tainting effect. Similarly, they perceived activities as more important than "normally" when they focused more on the outcome of the alternatives, which may explain why they also experienced less guilt. Hence, it is an oversimplification to state that, while procrastinating, people engage in less important activities compared to the focal activity (Van Eerde, 2016). Alternative activities can suddenly and temporarily be perceived as having a seemingly higher relative utility than the focal activity and thus serve as means to avoid the focal activity. In view of the dynamically changing activity characteristics, future research should go beyond the widespread dichotomy of *aversive but important* focal activities versus *pleasant but unimportant* alternatives. Procrastination includes the voluntary choice of one activity over another, but the definition does not pinpoint the characteristics of these activities (Steel, 2007). In fact, people also procrastinate projects they want to do, and occasionally even activities they

like (e.g., leisure activities; Grund et al., 2012; Steel, 2007). The mood regulation approach is likely to reach the limits of its explanatory power with regard to these instances of procrastination.

How is Procrastination Sustained?

This dissertation provided important insights into how goal focus is associated with activity evaluations during procrastination episodes (Part III). Moreover, the project showed that participants intend to disengage from alternative activities sooner when they focus more on the process of the alternative activity and that this effect is attenuated by a higher outcome focus (Part II). Why might a higher process focus be more adaptive once people procrastinate? It may be that people find it easier to stop procrastinating when they first engage in a pleasant alternative activity because it helps them to overcome starting problems (König & Kleinmann, 2004). In other words, when focusing on the process of a pleasant alternative activity, people may feel better, which might motivate and energize them to start the focal activity. However, behavioral intentions do not necessarily predict behavior. It is possible that the participants relinquished their intentions again as they did when procrastinating the focal activity in the first place (Lay, 1986; Steel, 2007). This calls for further research exploring both mechanisms sustaining procrastination and mechanisms leading to disengagement from the alternative activity.

At first glance, the finding that a higher outcome focus is associated with higher stress (Part III) does not fit well with the finding that outcome focus is negatively related to the intention to disengage from alternative activities (Part I). For example, mood-management theory (e.g., Isen, 1984; Parrott, 1993; Schwarz & Clore, 1983) suggests that when people are in a good mood, they try to maintain it. In contrast, when they are in a bad mood, they try to repair

it, for instance, by engaging in an activity that seems enjoyable (e.g., Tice et al., 2001; for inhibiting good moods and maintaining bad moods as adaptive strategies during goal pursuit, see, for example, Parrott, 1993). Why would people keep engaged in an alternative activity if it is perceived as stressful? Some psychodynamic theorists (e.g., Piers & Singer, 1971) argue that certain forms of emotional distress give rise to self-destructive tendencies such as the desire to suffer. In this view, not being able to enjoy the alternative activity or even engaging in aversive alternative activities may satisfy the desire to suffer, which stems from the awareness that one should be doing something else. A more straightforward explanation is that it is easier to justify one's procrastination when feeling bad. Alternatively, stress may lead to an inability to disengage from the alternative activity (Butts, Floresco, & Phillips, 2013), which may be a result of reduced self-regulatory capacity (Baumeister & Heatherton, 1996). This dissertation provides fertile ground for a future research program dedicated to finding out when people reach a cognitive and/or emotional threshold to disengage from alternative activities. Additionally, such a program may consider physiological measures such as heart rate and blood pressure, which are related to goal disengagement and persistence (e.g., Messay & Marsland, 2015), and can be recorded in everyday life (e.g., Shapiro, Jamner, Goldstein, & Delfino, 2001).

On the basis of Action Identification Theory (Vallacher & Wegner, 1987), Bayuk, Janiszewski, and Leboeuf (2010) found that people in an abstract mind-set (i.e., high-level identities) may show an increased willingness to pursue an alternative means to reach a goal. In contrast, a concrete mind-set (i.e., low-level identities) can decrease action flexibility and willingness to pursue alternative means (for the role of affect in this context, see Custers & Aarts, 2010; Marien, Aarts, & Custers, 2012). These considerations are relevant for future research because a higher outcome focus may be associated with a more abstract mind-set (Part

I). Hence, future studies may address whether outcome focus is positively associated with the likelihood of switching to other alternative activities that serve the same higher-order goal (e.g., watching TV instead of YouTube videos, which both fulfill the goal of entertaining oneself). Similarly, it may be that people with an abstract mind-set engage in alternative activities that are related to the focal activity (e.g., preparing for an exam instead of writing the thesis). In this case, procrastination may be sustained because it is relatively easy to rationalize one's behavior when focal and alternative activities serve the same higher-order goal (e.g., obtaining a degree). In contrast, people may have more difficulty rationalizing their behavior when they engage in alternative activities that are not related to the focal activity (e.g., watching TV instead of studying). In these situations, focusing on *why* one is engaged in an incongruent alternative activity (i.e., adopting an outcome focus) could remind people of the fact that they are not doing what they intended to do and lead to negative emotions such as guilt (e.g., Ferrari, 1991; Pychyl & Little, 1998). In this case, guilt may act as an adaptive regulator of behavior (Menesini & Camodeca, 2008) and support disengagement from the alternative activity.

Although it may be rarely true that alternative activities serve the same higher-order goal as the procrastinated focal activity, people may perceive the relationship between a particular focal and alternative activity differently depending on construal level. Research indicates that people form broader action categories when construing actions more abstractly and this in turn increases perceived concordance among one's behaviors (Freitas, Clark, Kim, & Levy, 2009). That is, construing one's actions in terms of their relatively abstract purposes promotes the perception that one's efforts sustain rather than conflict with one another. The perceived concordance in turn promotes positive affective experience and sustains motivational intensity. Similarly, adopting an outcome focus might increase perceived concordance between what one is

doing and what one should be doing, leading to more positive and less negative affect, thereby sustaining procrastination. However, in general, the results of this thesis do not seem to substantiate this reasoning because people did not feel better when they focused more on the outcome of alternative activities: Although outcome focus was negatively associated with guilt, it was positively associated with stress and negatively with pleasantness (Part III). Hence, it is not likely that people perceived concordance between alternative and focal goals. Such a finding would also be at odds with the argument that a stronger outcome focus is linked to an increased awareness that one procrastinates (Part III). Nevertheless, future research may investigate whether there are cases in which a stronger focus on the outcome of *the same* alternative activities reduces the perceived conflict between focal and alternative goals.

In sum, the fact that goals are organized hierarchically (e.g., Austin & Vancouver, 1996; Shah & Kruglanski, 2000) may have important implications for how people experience their procrastination. Future research on how procrastination is sustained should take this into account. First, however, it should be systematically tested whether a stronger outcome focus is associated with a more abstract mind-set (see also Freund & Hennecke, 2012). If outcome focus is indeed associated with an abstract mind-set, then a higher outcome focus regarding one goal should be associated with a higher outcome focus regarding other goals (even goals that are not related to the focal activity). The increase in outcome focus over time in both procrastination and non-procrastination episodes found in Part IV can be interpreted as evidence in support of this assumption. Alternatively, the increase in outcome focus is an effect of the approaching deadline: Regarding the focal activity, the looming deadline intensifies the salience of the positive consequences of goal-directed behavior or the negative consequences of missing the deadline (see also Krause & Freund, 2014b). We argue that time becomes more precious with the

approaching deadline for the focal activity and people need to increasingly justify why they are engaging in a particular alternative activity (i.e., adopt an outcome focus). The finding of synchronous time courses of outcome focus on focal and alternative activities (Part IV) represents an important extension of previous research. However, it should be noted that the reported time effects were small (Part IV) and time had only minor impact on the perception of activities (Parts II and III). Accordingly, the dynamic nature of goal focus and its effects on procrastination might be better addressed by linking goal focus to situational and person-related factors instead of tracing it to a deadline-driven process.

More research is also needed to explore to what extent the processes underlying procrastination are comparable to those that have been found for successful goal pursuit. For example, successful self-regulators shield their goals by selectively processing information about alternatives in order to increase the value of adhering to high-order goals and decrease the value of low-order temptations (e.g., Fishbach & Trope, 2008; Kuhl, 1984). Similarly, people with a tendency to procrastinate may reduce cognitive dissonance (Festinger, 1957) by focusing on the outcome and redefine their behavior as legitimate, that is, increase the value of alternative activities and decrease the value of the focal activity. In line with this reasoning, this dissertation (Part III) found that people with a higher outcome focus perceive the alternatives as more important during procrastination episodes as compared to their general ratings of the same activities. However, it was not analyzed whether there is a simultaneous devaluation of the focal goal and whether people selectively process information about alternative and focal activities. It may be that people with a tendency to procrastinate temporarily limit their evaluations to single dimensions (e.g., pleasantness) on which the alternatives are rated more favorably than the focal

activity, although considering and integrating all relevant dimensions would favor the focal activity.

Goal Focus and Procrastination Across Adulthood

Freund et al. (2010) found that older adults usually focus more on the process of goal pursuit, whereas younger adults tend to focus more on the outcome. We also explored the relationship between age and goal focus in the workout study, although it was not the main focus of this dissertation. We found that older (vs. younger) participants focused more on the process of the focal (and alternative) activities. In contrast, age was not related to outcome focus. This may suggest that the age-related shift in goal focus is primarily driven by changes in process focus, supporting the findings of Freund et al. (Study 1). However, in a different study by the same authors (i.e., Study 3), younger adults reported a stronger outcome focus than older adults, whereas the two age groups did not differ significantly in process focus (although within the older age group, people reported a stronger process than outcome focus). The inconsistent findings may be due to the fact that participants rated goal focus only once at the beginning of goal pursuit (i.e., when starting to exercise) in the study by Freund and colleagues, whereas our correlation was based on within-person average scores of process and outcome focus across the entire actional phase of goal pursuit. On the one hand, having multiple measurements may increase the reliability of the results. On the other hand, it may obscure the dynamic changes in goal focus that occur even *within* single age groups (Part IV). Given that age differences were not a central focus of this dissertation, we did not intend to obtain an age-balanced sample (i.e., more younger than older adults signed up for the workout study), potentially biasing our age-related results. Nevertheless, the discrepancies between the findings suggest that more research is needed to determine whether the shift in goal focus across adulthood is primarily driven by age-

related changes in process focus, outcome focus, or a combination of both. Again, this can only be investigated when process and outcome focus are operationalized as two separate dimensions.

Distinct but related mechanisms have been proposed to explain the shift in goal focus across adulthood—namely, declines in resource availability and future time perspective, and changing goal orientation (see Freund et al., in press). For instance, regarding goal orientation, there is a changing ratio of gains to losses over the lifespan, encompassing decreasing gains and increasing losses (e.g., Baltes, 1987). Addressing this changing ratio, the model of selection, optimization, and compensation (e.g., Baltes & Baltes, 1990; Freund & Baltes, 2002) holds that goals of young adults are primarily outcome-oriented because the consequences of goal achievement are tangible (i.e., a diploma, a job, a mate). In contrast, older adults are more oriented toward maintaining their level of functioning and avoiding losses (Ebner, Freund, & Baltes, 2006; Freund & Riediger, 2006). This orientation toward maintenance and loss avoidance (e.g., staying healthy) has an inherent process-oriented aspect as it implies a constant monitoring of one's actual performance vis-à-vis a progressively declining level of functioning (Freund et al., in press).

Although younger adults tend to be more outcome-focused, Freund et al. (2010) showed that they would benefit from adopting a process focus. Part II provided further support for this finding. Hence, from a functional perspective, the question arises why younger adults often adopt an outcome focus. One plausible answer is that younger adults still have to think a lot—and more so than older adults—about what outcomes they consider desirable and attainable in their lives. In other words, they are frequently in the phase of goal setting, during which an outcome focus has been suggested to be adaptive (see Freund et al., in press; Krause & Freund, 2014b). As described above, it is critical that future research extends its focus to investigating the

adaptiveness of goal focus in action phases of goal pursuit other than the actional phase, such as goal setting.

Additionally, in the workout study, we explored the association between age and procrastination. Findings indicated that age was negatively correlated with procrastination, supporting the existing evidence to date (Díaz-Morales et al., 2008; Gupta et al., 2012; Steel, 2007; Steel & Ferrari, 2013). The age differences in procrastination are in line with the multidimensionality and multidirectionality proposition of lifespan developmental psychology. On the one hand, functional losses in old age might be inevitable in some domains, such as executive functioning (see Baltes, 1987). On the other hand, self-regulation, and thus likely also procrastination, is a domain in which gains in old age are still possible. For example, older adults are successful in regulating their affect (Gross et al., 1997; Scheibe & Carstensen, 2010), which is an essential skill to overcome procrastination (Sirois & Pychyl, 2013). Similarly, older adults score higher on some facets of conscientiousness than younger adults (J. J. Jackson et al., 2009), a characteristic that is negatively related to procrastination (Steel, 2007). Other mechanisms that may lead to a decline in procrastination across adulthood were presented in Part V (e.g., more intergoal facilitation and less intergoal interference; Riediger, Freund, & Baltes, 2005) and complement more straightforward explanations of age differences, which can be derived from previous research. For instance, Ainslie (1992) and Baumeister, Heatherton, and Tice (1994) reviewed a great amount of research showing that people tend to procrastinate less with repeated practice. Similarly, O'Donoghue and Rabin (1999) argued that people may develop schemes to overcome procrastination over time. Hence, do older adults simply procrastinate less because they have had more opportunities and time in life to try out and optimize different strategies (see also Hennecke & Freund, 2010, for age-related practice effects in self-regulation)?

Furthermore, in Part V, we touched upon how future research might investigate the proposed mechanisms (e.g., by experimentally manipulating future time perspective). Additional research questions that need to be addressed can be derived from Part I. For example, we described results from research based on construal level theory showing that a shorter (vs. longer) time perspective leads people to represent a goal as more concrete and urgent, and thereby to procrastinate less (McCrea et al., 2008). Given that construal level and goal focus are distinct constructs (Part I), the question arises whether goal focus also acts as a mediator for the relationship between time perspective and procrastination when manipulating time perspective. Similarly, a manipulation of the availability of resources and goal orientation allows for the testing of specific hypotheses. For instance, do younger adults focus more on the process when they perceive their personal resources as constrained and, hence, procrastinate less? In general, knowing resources and strategies older adults use to reduce procrastination might be valuable for adapting interventions to reduce procrastination in younger and middle-aged adults. Naturally, addressing age differences in procrastination requires an extension of the scope to non-academic contexts, where the character of goals might differ as they, for example, may lack clear deadlines (e.g., bedtime procrastination; Kroese et al., 2016).

A New Way to Measure Procrastination and Methodological Considerations

Previous research has mostly used either established questionnaires to measure procrastination (e.g., Krause & Freund, 2016) or directly asked participants whether they are procrastinating at the moment or not (e.g., Pychyl et al., 2000). The innovative approach that we used in this dissertation is to track the process and outcome focus on alternative activities during procrastination episodes over several weeks—without directly asking the participants whether they were procrastinating. As explained in the Introduction, this method has the advantage that it

avoids retrospective biases, it is not too burdensome for participants, and takes into account the dynamic nature of goal focus and procrastination. However, one possible disadvantage is that possible short-term time adjustments are not sufficiently considered. Short-term changes in plans are characteristic for procrastination, hence we allowed people to change their time windows only until the day before they intended to engage in the focal activity. Nevertheless, adjustments of time windows may be necessary on a *very* short time scale due to external circumstances (e.g., computer crash when wanting to work on the thesis). Future studies might therefore take an even more dynamic approach and allow continuous adjustments of time windows. This requires the development of software, which automatically processes incoming data on participants' plans and adjusts the sending times of the questionnaires accordingly.

To further validate our behavioral approach, future research should also investigate how behavioral procrastination is linked to common measures of trait and state procrastination (see also Krause & Freund, 2014a; Sirois & Pychyl, 2016). However, it should be noted that past research using different operationalizations of behavioral procrastination has found only moderate correlations between behavioral and self-reported procrastination, and there is some controversy about whether self-report measures are valid indicators of actual procrastination at all (Kim & Seo, 2015; Krause & Freund, 2014a; Rotenstein, Davis, & Tatum, 2009; Steel et al., 2001; Tice & Baumeister, 1997).

To the best of our knowledge, our studies are the first to differentiate between within- and between-person effects in the context of procrastination. This differentiation is essential because psychological processes are often non-ergodic, which means that regularities found by comparing single individuals with one another do not necessarily mirror regularities in within-person change over time (Bolger & Laurenceau, 2013). We found that regarding alternative

activities within-person effects were stronger (Part III), whereas regarding the focal activity the between-person effects were stronger (Part II). Hence, the dynamics underlying procrastination episodes may be constrained to the lower level within-person scales, which approaches focusing on the between-person level are unable to capture. Against this backdrop, future research should investigate how momentary fluctuations of dynamic constructs such as mood affect goal focus within single individuals (see also Freund, 2017).

Furthermore, this dissertation provided evidence for the conceptualization of goal focus as a state that varies over time (Parts II, II, and IV). This is in line with the conceptualization of goal focus not only as a trait-like construct of habitually focusing more on the process or the outcomes of goal pursuit but also as a more state-like construct that can change depending on the motivational phase, age, and situational factors (Freund et al., 2012; Krause & Freund, 2014b). On the basis of the results of this thesis, future research should examine the distinction of goal focus as a trait versus state and their links to procrastination in greater depth.

Causal Relations Between Goal Focus, Activity Characteristics, and Procrastination

The studies carried out have high ecological validity for the study of procrastination. However, it is imperative to emphasize that this thesis is based on correlational designs. Accordingly, we cannot infer causal effects. An experimental manipulation of goal focus in a controlled environment would be necessary to determine the direction of the relation between goal focus and measures such as activity characteristics. Later, experimental research could be combined with longitudinal field studies, for example, by inducing a certain goal focus and measuring its adaptiveness for procrastination, goal achievement, and subjective well-being in real life.

Unfortunately, previous attempts to experimentally manipulate goal focus have not been entirely successful. In the context of this dissertation, we conducted a study in which participants were asked to do a text correction task while focusing either on the means or the outcome of goal pursuit. The concept of goal focus was introduced to them and they had to come up with own examples for what constitutes a process or outcome focus in the text correction task. However, a manipulation check administered immediately after the text correction task revealed that this attempt was not successful in manipulating goal focus. Similarly, Pham and Taylor (1999) used a simulation exercise in which students were instructed to mentally simulate themselves studying for an exam (i.e., process simulation) and/or to attain a high score on the exam (i.e., outcome simulation). Although the authors found differential effects of process and outcome focus, an assessment of action identification level (Vallacher & Wegner, 1985) indicated that the manipulation was only partly successful. Specifically, goal focus changed the level at which individuals identified actions: Participants in the process (vs. outcome) simulation group agreed more strongly with the statement that they would read materials (i.e., a low-level action). However, the process (vs. outcome) focus group also viewed their actions as more accurately characterized by middle-level (e.g., getting a good grade) and high-level actions (e.g., gaining general academic skills), which according to our conceptualization of goal focus should rather go along with an outcome focus. Fishbach and Choi (2012) used a writing exercise to manipulate participants' focus on the instrumentality or experience of goal pursuit. However, they did not report a manipulation check. Therefore, it is crucial to validate existing manipulations and, if necessary, establish new ones to clarify the causal ordering of goal focus and its correlates. One such new approach may rely on inducing different time perspectives. Up until now, process focus has mainly been allied to a focus on the present (i.e., "What am I doing now or what do I

need to do now?"), which may confound with outcome focus because thinking about what one needs to do now may evoke thoughts about what one wants to achieve (see also Thompson et al., 2009). In contrast, similar to the concept of life stories (McAdams, 2001), additionally integrating a past perspective (i.e., "What have I done to get where I am now and what happened more serendipitously?") into present and future views of the goal may induce a purer process focus.[7] Life stories "organize life events into a gestalt structure that establishes connections between those events so that the person's life is experienced as a coherent unfolding *process* [emphasis added]" (Shamir & Eilam, 2005, p. 402). The same may apply to cognitive representations of goal pursuit. Moreover, one might speculate that embedding the present between a "symmetry" of past and future highlights the present, whereas an exclusive focus on the present or the connection between present and future (i.e., process focus) and future (i.e., outcome focus) is more likely to be biased towards the future.

Practical Implications

In light of the large body of research documenting negative effects of procrastination on subjective well-being (Part I), researchers and practitioners have been developing interventions designed to help people to overcome procrastination and enhance goal pursuit (e.g., Dryden, 2012; Eckert, Ebert, Lehr, Sieland, & Berking, 2016; Scent & Boes, 2014; Van Eerde, 2003). For instance, Grunschel, Patrzek, Klingsieck, and Fries (2018) developed and successfully validated a group intervention that centers around improving deficient processes of self-regulated learning among students (e.g., time management, dealing with distractions). However, the general axiom in applied psychology that different problems or individuals require different solutions (Paul, 1967) also applies to procrastination. There are a variety of reasons (i.e., task characteristics such

[7] I am indebted to Fuschia Sirois for alerting me to this idea in a personal conversation.

as task aversiveness as well as individual difference variables such as low conscientiousness) why people might irrationally delay a task (e.g., Zacks & Hen, 2018). Hence, apart from providing people with general knowledge pertaining to procrastination (i.e., its antecedents, consequences, and strategies to overcome procrastination; see Steel, 2007), interventions are most effective when strategies are applied selectively or in various combinations to fit an individual's needs (Day, Mensink, & O'Sullivan, 2000; Steel et al., 2018).

Contributing to basic research on goal pursuit and procrastination, this thesis suggests that an essential starting point for interventions should be raising the awareness about how process and outcome focus might sustain procrastination. While merely monitoring one's behavior may already lead to behavior change (Verhoeven, Adriaanse, Vet, Fennis, & De Ridder, 2014), people, for example, should additionally be taught that an outcome focus may increase the perceived importance of an alternative activity, thereby appeasing feelings of guilt and sustaining procrastination (Parts II and III). Similarly, many scholars have addressed the short-term mood repair that procrastination provides at the expense of well-being in the future (e.g., Sirois & Pychyl, 2013; Tice & Baumeister, 1997). A high process focus may render people particularly vulnerable to short-term mood regulation as they experience alternative activities as more pleasant when focusing more on the process (Part III). Thus, it may neither be adaptive to focus on the outcome nor the process of alternative activities in and of itself. How can the same focus have different effects? For instance, if outcome focus is indeed linked to an increased awareness that one procrastinates (Part III), to some people this may serve as a stop signal to procrastination, whereas to others it may serve as a start signal to rationalize their procrastination. Thus, an outcome focus may only be adaptive if, at the same time, it is possible

to inhibit the rationalization processes that we assume to drive the changes in the perception of alternative activities.

Different strategies aimed at supporting one's powers of good judgment can reduce the temptation to rationalize one's procrastination (see Anderson, 2016). Structural strategies focus on facilitating access to the reasons why delay would be unwarranted by overcoming biases, such as hyperbolically discounting the impact our choices will have on our future selves, that might feed into rationalizations. One such promising strategy for visualizing the impact of current choices on one's future self and for strengthening the connection to one's future self is mental imagery (Blouin-Hudon & Pychyl, 2017).

A different set of strategies to block rationalizations are accountability procedures, which might also be helpful for more impulsive types of procrastination: By regularly and explicitly reviewing one's priorities and commitments (see Allen, 2015)—especially with a neutral interlocutor—one can establish a procedure that is supported by habits and social pressure, and during which it is difficult to rationalize one's behavior (Anderson, 2016).

Furthermore, process focus was negatively linked to procrastination and clearly more adaptive than outcome focus with regard to the focal goal of exercising regularly (Part II). Sport programs can make use of this finding by, for example, trying to influence athletes to think more about the means of working out (e.g., how to best plan their workout sessions, on which aspects of the exercises to focus most) rather than imagining how great being more muscular or slimmer would be. However, having a strong or rigid process focus might not be adaptive since people may lose track where they are heading (Part I). Accordingly, the may end up pursuing goals that are not desirable and attainable anymore. Similarly, they may be too absorbed in the process of goal pursuit, thereby missing deadlines for desired outcomes. Thus, given that also outcome

focus was positively related to immediate outcomes such as motivation (Part II), people may best be served by being taught how to flexibly adjust their goal focus to the current situation and needs. Some people may get "stuck" and fail to shift focus when necessary. For instance, state-oriented people exhibit a highly generalized and inflexible tendency of decoupling perception and action that is accompanied by excessive reflections about past failures or future possibilities and alternative courses of action (e.g., Kuhl, 1985; Kuhl & Baumann, 2000). This orientation is linked to difficulties in controlling negative emotions and taking actions when positive mood is low, which makes state-oriented people susceptible to procrastination (Sirois & Giguère, 2018). Hence, particularly those people may benefit from training. At any case, the ability to adjust one's goal focus requires higher-order attentional skills such as meta-cognitive awareness and cognitive flexibility, which, for example, can be fostered by mindfulness practice (e.g., Moore & Malinowski, 2009).

Conclusions

The empirical evidence resulting from this thesis provides the following main messages: First, goal focus is dynamic. People not only differ with regard to the extent to which they focus on the process and the outcome of goal pursuit on average, but goal focus also varies within persons and influences how they evaluate both focal and alternative activities. Moreover, goal focus changes with an approaching deadline and this change depends on the type of activity. Second, a process focus is more beneficial during goal pursuit and procrastination episodes than an outcome focus since it is related to better self-regulation, goal achievement, and a higher intention to disengage from alternative activities. However, outcome focus is not necessarily maladaptive since it is also related to indicators of successful goal pursuit such as motivation.

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APPENDIX

Appendix A: Measures and Items Used in Workout Study

All items were administered in German; translations into English by the author.

Registration

- Informed consent
- First name / surname
- Email address
- Phone number
- Sex (male, female)
- Date of birth
- Civil status (single, married/partnership, widowed, divorced/after break up)
- Number of children
- Highest grade (compulsory education/lower secondary education, upper secondary level education [vocational education, baccalaureate school, or upper secondary specialized schools], university degree, other degrees).
- "Do you currently work?" (yes [percentages?], no)
  - If yes: job; if no: "I'm (a/an)…?" (1 = student, 2 = apprentice; 3 = unemployed; 4 = retiree; 5 = housewife/househusband; if 1: field of study; if 2: type of apprenticeship; if 3, 4, 5: Since when? Last job?)
- Physical health ("All in all, how do you rate your physical health?"; 1 = very bad; very good)
- Life satisfaction ("All in all, how satisfied are you with your life?"; 1 = not at all; 7 very much)
- Gross (household) income
- Health questionnaire
  - "How would you describe your state of health in general?" (1 = very bad; 7 very good)
  - "Do you regularly take drugs, stimulants, or tranquilizers? If yes: which ones and how often?" (open question)
  - "Do you regularly take medications? If yes: which ones and how often?" (open question)
  - "Are you currently under medical treatment? If yes: Because of which diseases are you treated?" (open question)
  - "Do you suffer from any of the following heart or cardio-vascular diseases?" (yes/no)
    - Cardiac insufficiency
    - Irregular heartbeat
    - Cardiac asthma / angina pectoris
    - Hypertension
    - Circulatory disorders
    - Others?
  - Indication of number of repetitions in a one minute sit-to-stand test (Bohannon et al., 2010): "How often do you manage to sit on a chair within 1 minute, stand up straight and sit down again?"

        - "Do you smoke? If yes, how many cigarettes a day?" (open question)
        - Somatization subscale of the SCL-90-R (Derogatis, 1977; Franke, 1995; 1 = never; 7 = very often) including a control question: "For technical reasons, please select the box on the far right."
        - "Do you have any other existing health issues? If so, which ones?"
    - "What kind(s) of physical activity do you regularly engage in? How often a week and for how long?" (open question)
    - "Is this your first time participating in a training program?" (yes/no)

Pre-study fitness test

- Fitness test: Hold the plank position for as long as possible, hold the squat position for as long as possible, perform as many high knees as possible within one minute, and perform as many push-ups as possible without a break.
- Physical measures: height, weight, BMI, total body fat (%), total body water percentage, muscle mass, overall assessment, bone mass, basal metabolic rate, metabolism age

Baseline questionnaire

- Personal goals regarding the four test exercises (see above): "How many repetitions do you want to achieve after the 8 weeks of training or how long do you want to be able to hold the position? Please write a number in the space provided. If you do not have a specific goal, please enter 0." (number of repetitions/seconds)
- "What other personal goal(s) do you want to pursue with the workout?" (open question)
- Questions regarding the upcoming workout period:
    - "How important is the **pursuit** of this goal for you?" (1 = not at all; 7 = very much)
    - "How important is the **achievement** of this goal for you?" (1 = not at all; 7 = very much)
    - "How **likely** is it that you will achieve this goal?" (1 = not at all; 7 = very much)
    - "How pleasant will the **pursuit** of this goal be?" (1 = not at all; 7 = very much)
    - "How pleasant would **the achievement** of this goal be?" (1 = not at all; 7 = very much)
    - "How important is it for you **in general** to achieve your sports goals?" (1 = not at all; 7 = very much)
    - "How useful is this workout to achieve your **goals pertaining to this study**?" (1 = not at all; 7 = very much)
    - "How useful is this workout to achieve your **general sports goals**?" (1 = not at all; 7 = very much)
- Questions regarding the workout:
    - "How **important** is the workout?" (1 = not at all; 7 = very much)
    - "How **important** is physical activity for you **in general**?" (1 = not at all; 7 = very much)
    - "How **pleasant** is the workout?" (1 = not at all; 7 = very much)
    - "How **pleasant** is physical activity for you **in general**?" (1 = not at all; 7 = very much)

    - "Is the workout immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
    - "How **difficult** is the workout?" (1 = not at all; 7 = very much)
    - "How **stressful** is the workout?" (1 = not at all; 7 = very much)
    - "How **motivated** are you to do the workout?" (1 = not at all; 7 = very much)
    - "How **urgent** is it to do the workout?" (1 = not at all; 7 = very much)
    - "Do you **feel guilty** when you **do not** work out?" (1 = not at all; 7 = very much)
    - "Do you **feel guilty** when you **work out** (because you should do other things)?" (1 = not at all; 7 = very much)
    - "How much do you think about **what you need to do** in order to complete the workout successfully?" (1 = not at all; 7 = very much)
    - "How much do you think about **why** you want to complete the workout successfully?" (1 = not at all; 7 = very much)
    - "When I'm working out, my motto is '**The way is the goal**.'" (1 = not at all; 7 = very much)
    - "When I'm working out, my motto is '**No matter how, as long as I reach the goal.**'" (1 = not at all; 7 = very much)
- Mood: "good-bad mood" subscale (all items 1 = not at all; 7 = very much) from the German version of the Multidimensional Mood State Questionnaire (MDBF; Steyer et al., 1997)
- "When you think about the workout: Which of the following statements do you think about most? Please allocate a total of 100 points to the following statements. The more points you allocate to a statement, the more likely it is to apply to you personally.":
    - "Ensure that the exercises are carried out correctly." (Process focus)
    - "Lose weight." (Outcome focus)
    - "Breathe properly and consciously." (Process focus)
    - "Be satisfied with my performance." (Outcome focus)
    - "Feel my muscles." (Process focus)
    - "Increase muscle mass / become stronger." (Outcome focus)
    - "Be fully focused on the current exercise." (Process focus)
    - "Doing something for my fitness/health." (Outcome focus)
    - "Clench my teeth when it gets though." (Process focus)
    - "Prove to myself that I can achieve something." (Outcome focus)
- Evaluation of different (groups of) activities on the following dimensions: **pleasantness** (i.e., "How pleasant is this activity for you?"; 1 = very unpleasant, 7 = very pleasant), **importance** (i.e., "How important is this activity for you in general?"; 1 = very unimportant, 7 = very important), **procrastination** (i.e., "How often do you engage in this activity when procrastinating on exercising?"; 1 = never, 7 = very often), **facilitation** (i.e." How much does this activity facilitate working out in general?"; 1 = not at all, 7 = very much), **conflict** (i.e., How much does the activity conflict with working out in general?"; 1 = not at all, 7 = very much):
    - Chores
    - Neaten

        - Make lists
        - Administrative tasks
        - Relax/sleep
        - Multimedia
        - Eat/cook
        - Meet friends/family
        - (Online-)Shopping
        - Social media / phone
        - Surf the internet (without social media)
        - Read
        - Daydream / play with pets
        - Stroll
        - Ruminate
        - Study
        - Work
        - Job Hunt
        - Slack
        - Help others
        - Smoke
        - Participate in studies
        - Be on the way
        - Take a break
        - Vacation
        - "Can you think of any other activities that you pursue in your everyday life that have not yet been mentioned? Please write each of them on a separate line and rate them as well."
    - "How much do you **generally** live by the following mottos?":
        - "The way is the goal" (1 = not at all, 7 = very much)
        - "No matter how, as long as I reach the goal" (1 = not at all, 7 = very much)
    - "How far away is the end of the 8-week workout period for you at the moment?" (Slider from 0 = very far away to 100 = very close)
    - "How confident are you that you will achieve your personal workout-related goals?" (Slider from 0 = not at all confident to 100 = very confident)
    - Trait procrastination: Pure Procrastination Scale (Krause & Freund, 2014a; Steel, 2010) including the same control question as above.
    - "This workout program consists of 4 weekly workout sessions of 16 minutes each over a period of 8 weeks. Please indicate four weekdays and four one-hour time windows within which you will do the 16-minute workout." (dropdown menu)

Workout/procrastination questionnaire

- "Have you been working out before receiving this questionnaire?" (yes/no)
- "Have you been doing what you were supposed to do?" (yes / no, I should have been doing something else, namely…)
- "Have you been doing what you wanted to do? (yes / no, I would have wanted to do something else, namely…)

- If first question of questionnaire was answered with 'yes': "You indicated that you had been working out. Please answer the following questions regarding this activity":
  - "How **pleasant** was this activity?" (1 = not at all; 7 = very much)
  - "How **important** was this activity?" (1 = not at all; 7 = very much)
  - "How **difficult** was this activity?" (1 = not at all; 7 = very much)
  - "How **stressful** was this activity?" (1 = not at all; 7 = very much)
  - "How **motivated** were you to engage in this activity?" (1 = not at all; 7 = very much)
  - "Did you **feel guilty** while engaging in this activity?" (1 = not at all; 7 = very much)
  - "Would you have **felt guilty** if you **had** not engaged in this activity?" (1 = not at all; 7 = very much)
  - "How **urgent** was it to engage in this activity?" (1 = not at all; 7 = very much)
  - Outcome focus: "To what extent were you focusing on what you want to **achieve** with this activity?" (1 = not at all; 7 = very much)
  - Process focus: "To what extent were you focusing on the **activity itself**?" (1 = not at all; 7 = very much)
  - "When working out, my motto was '**The way is the goal.'**" (1 = not at all; 7 = very much)
  - "When working out, my motto was '**No matter how, as long as I reach the goal.'**" (1 = not at all; 7 = very much)
  - "Did you experience the activity as immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
- If first question of questionnaire was answered with 'no': "You indicated that you had not been working out. What did you do?" (open question) "Please answer the following questions regarding this activity":
  - "How **pleasant** was this activity?" (1 = not at all; 7 = very much)
  - "How **important** was this activity?" (1 = not at all; 7 = very much)
  - "How **difficult** was this activity?" (1 = not at all; 7 = very much)
  - "How **stressful** was this activity?" (1 = not at all; 7 = very much)
  - "How **motivated** were you to engage in this activity?" (1 = not at all; 7 = very much)
  - "Did you **feel guilty** while engaging in this activity?" (1 = not at all; 7 = very much)
  - "Would you have **felt guilty** if you had **not** engaged in this activity?" (1 = not at all; 7 = very much)
  - "How **urgent** was it to engage in this activity?" (1 = not at all; 7 = very much)
  - "How much does this activity **facilitate** the workout?" (1 = not at all; 7 = very much)
  - "How much does this activity **conflict** with the workout?" (1 = not at all; 7 = very much)

        - Outcome focus: “To what extent were you focusing on what you want to **achieve** with this activity?” (1 = not at all; 7 = very much)
        - Process focus: “To what extent were you focusing on the **activity itself**?” (1 = not at all; 7 = very much)
        - “When engaged in this activity, my motto was **‘The way is the goal.’**" (1 = not at all; 7 = very much)
        - “When engaged in this activity, my motto was ‘**No matter how, as long as I reach the goal**.’" (1 = not at all; 7 = very much)
        - “Did you experience the activity as immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?” (1 = immediately rewarding; 7 = rewarding later in time)
        - “Please also answer the following questions **regarding the workout**:”
        - “How **pleasant** is the workout?” (1 = not at all; 7 = very much)
        - “How **important** is the workout?” (1 = not at all; 7 = very much)
        - “How **difficult** is the workout?” (1 = not at all; 7 = very much)
        - “How **stressful** is the workout?” (1 = not at all; 7 = very much)
        - “How **motivated** are you to work out?” (1 = not at all; 7 = very much)
        - “Do you **feel guilty** when you do **not** work out?” (1 = not at all; 7 = very much)
        - “Do you **feel guilty** when you work out (because you should do other things)?” (1 = not at all; 7 = very much)
        - “How **urgent** is it that you work out?” (1 = not at all; 7 = very much)
        - Outcome focus: “To what extent do you focus on what you want to **achieve** with the workout?” (1 = not at all; 7 = very much)
        - Process focus: “To what extent do you focus on the **workout itself**?” (1 = not at all; 7 = very much)
        - “When working out, my motto is **‘The way is the goal.**’" (1 = not at all; 7 = very much)
        - “When working out, my motto is **‘No matter how, as long as I reach the goal.’**" (1 = not at all; 7 = very much)
        - “Is the workout immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?” (1 = immediately rewarding; 7 = rewarding later in time)
    - Mood: “good-bad mood” subscale (all items 1 = not at all; 7 = very much) from the German version of the Multidimensional Mood State Questionnaire (MDBF; Steyer et al., 1997)
    - “How far away is the end of the 8-week workout period for you at the moment?” (Slider from 0 = very far away to 100 = very close)
    - “How confident are you that you will achieve your personal workout-related goals?” (Slider from 0 = not at all confident to 100 = very confident)
    - “What do you intend to do after completing the questionnaire?”
        - If first question of questionnaire was answered with ‘yes’: 1 = Work out for about __ minutes, 2 = something else, namely ____ for about __ minutes.
        - If first question of questionnaire was answered with ‘no’: 1 = Keep doing what I was doing before the questionnaire for about __ minutes, 2 = work out for about __ minutes, 3 = something else, namely ___ for about__ minutes.

Weekly review

- "How do you evaluate the past week? The following questions relate only to the training for this study."
  - "Have you worked out **as often** as you had planned?" (Slider 0 = less than planned to 100 = more than planned)
  - "Have you worked out **as long** as you had planned?" (Slider 0 = less than planned to 100 = more than planned)
  - "Have you worked out **as intensively** as you had planned?" (Slider 0 = less than planned to 100 = more than planned)
  - "Overall, how satisfied are you with the past week with regard to the workout?" (1 = not at all, 7 = very much)
- "We had asked you to write down the start/end time of all workout sessions you did the past week. Please write them down here." (empty lines)
- "Did you engage in other physical activity than the workout?" (yes/no)
  - If 'yes': "We had asked you to write down the start/end time of all sport sessions you did over and above the workout for this study. Please write them down here and also what kind of physical activity it was." (empty lines)
- „Did you always work out when you had planned to do so in the past week"? (yes/no)
  - If 'no': "What did you do instead? Please name a maximum of three activities in which you engaged most often." (empty lines) "Please rate the activities on the following dimensions":
    - "How **often** did you engage in this activity?" (1 = very rarely, 7 = very often)
    - "How **important** is this activity?" (1 = not at all, 7 = very much)
    - "How **pleasant** is this activity?" (1 = not at all, 7 = very much)
- "Were there moments when you had planned to do something else but worked out instead?" (yes/no)
  - If 'yes': "What had you planned to do? Please name a maximum of three activities you put off most often." (empty lines) "Please rate the activities on the following dimensions":
    - "How **often** did you put off this activity?" (1 = very rarely, 7 = very often)
    - "How **important** was this activity?" (1 = not at all, 7 = very much)
    - "How **pleasant** was this activity?" (1 = not at all, 7 = very much)
- "When you think about the workout: Which of the following statements do you think about most? Please allocate a total of 100 points the following statements. The more points you allocate to a statement, the more likely it is to apply to you personally.":
  - "Ensure that the exercises are carried out correctly." (Process focus)
  - "Lose weight." (Outcome focus)
  - "Breathe properly and consciously." (Process focus)
  - "Be satisfied with my performance." (Outcome focus)
  - "Feel my muscles." (Process focus)
  - "Increase muscle mass / become stronger." (Outcome focus)
  - "Be fully focused on the current exercise." (Process focus)
  - "Doing something for my fitness/health." (Outcome focus)

    - "Clench my teeth when it gets though." (Process focus)
    - "Prove to myself that I can achieve something." (Outcome focus)
- State Procrastination: Adapted version (replacing "studying" with "workout") of the Academic Procrastination State Inventory (Schouwenburg, 1995; German translation by Helmke & Schrader, 2000).
- "If you skipped a questionnaire last week: why?" (open question)
- "Was the past week rather average for you?" (yes/no)
- "Did you experience any extraordinary events last week (e.g., high stress, promotion, wedding, death of a loved one)? If yes: what and when?"
- "Did you behave differently than usual in some situations due to the study? If yes: when and in what situation?"
- "How well were you able to express your actual feelings with the help of the list of feelings we provided?" (1 = not at all, 7 = very much)

Post-study fitness test

- Identical to pre-study fitness test (see above).

Final questionnaire

- Mood: "good-bad mood" subscale (all items 1 = not at all; 7 = very much) from the German version of the Multidimensional Mood State Questionnaire (MDBF; Steyer et al., 1997)
- "In the following questions, we ask you to evaluate the entire 8-week workout period. Please think back over the past weeks and answer the following questions."
- "Did you estimate the **amount of effort required** for the workout correctly?" (Slider from 0 = I underestimated it to 100 = I overestimated it)
- "Did you set yourself rather **intermediate goals** or did you focus **on the big end goal**? (Slider from 0 = small goals to 100 = big goals)
- "Was your training 'more successful' **the closer** or **further away** the end of the training was?" (Slider from 0 = far away from the end to 100 = close to the end)
- "Was it harder to **start working out** or **to stay tuned** once you started?" (Slider from 0 = beginning was harder to 100 = staying tuned was harder)
- "At times I did not work out although I had planned to do so…
    - …I constantly had to think about the training" (1 = not at all; 7 = very much)
    - …I was motivated to do things I wouldn't have done otherwise" (1 = not at all; 7 = very much)
    - …I engaged in **unpleasant** (0) vs. **pleasant** activities (100) instead" (Slider)
    - …I engaged in **unimportant** (0) vs. **important** activities (100) instead" (Slider)
    - …I engaged in **non-urgent** (0) vs. **urgent** activities (100) instead" (Slider)
- "How **satisfied** are you overall regarding the workout?" (1 = not at all; 7 = very much)
- "How **pleasant** was the workout?" (1 = not at all; 7 = very much)
- "How **important** was the workout?" (1 = not at all; 7 = very much)
- "How **difficult** was the workout?" (1 = not at all; 7 = very much)
- "How **stressful** was the workout?" (1 = not at all; 7 = very much)
- "How **motivated** were you to work out?" (1 = not at all; 7 = very much)
- "Did you **feel guilty** when you did **not** work out?" (1 = not at all; 7 = very much)

- "Did you **feel guilty** when you worked out (because you should have done other things)?" (1 = not at all; 7 = very much)
- "How **urgent** was it to work out?" (1 = not at all; 7 = very much)
- Outcome focus: "To what extent did you focus on what you want to **achieve** with the workout?" (1 = not at all; 7 = very much)
- Process focus: "To what extent did you focus on the **workout itself**?" (1 = not at all; 7 = very much)
- "When working out, my motto was **'The way is the goal.'**" (1 = not at all; 7 = very much)
- "When working out, my motto was **'No matter how, as long as I reach the goal.'**" (1 = not at all; 7 = very much)
- "Did you experience the workout as immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
- "I would have worked out more often if I had had more time." (1 = not at all; 7 = very much)
- "I would have worked out less often without the external pressure." (1 = not at all; 7 = very much)
- "I put myself under pressure regarding the workout." (1 = not at all; 7 = very much)
- "I complied with the workout times I had planned." (1 = not at all; 7 = very much)
- "I struggled to give the workout a permanent place in my everyday life." (1 = not at all; 7 = very much)
- "I often had disturbing thoughts when exercising." (1 = not at all; 7 = very much)
- "I often did not notice how time flies when training." (1 = not at all; 7 = very much)
- "I had been looking forward to working out again after longer breaks." (1 = not at all; 7 = very much)
- "At the beginning of the workout, you had specified a personal workout-related goal, namely …. Did you achieve this goal or not?" (yes; no, but I can still achieve it; no, and I cannot achieve it anymore)
  - If 'yes':
    - "How important was the achievement of this goal?" (1 = not at all; 7 = very much)
    - "How pleasant was/is the achievement of this goal?" (1 = not at all; 7 = very much)
  - If 'no, but I can still achieve it':
    - "How important is the achievement of this goal?" (1 = not at all; 7 = very much)
    - "How likely is it that you will still achieve this goal? (1 = not at all; 7 = very much)
    - "How pleasant would the achievement of this goal be?" (1 = not at all; 7 = very much)
  - If 'no, and I cannot achieve it anymore':
    - "How important was the achievement of this goal for you?" (1 = not at all; 7 = very much)
    - "How pleasant would it have been if you had achieved this goal?" (1 = not at all; 7 = very much)

- State Procrastination: Adapted version (replacing “studying” with “workout”) of the Academic Procrastination State Inventory (Schouwenburg, 1995; German translation by Helmke & Schrader, 2000).
- “During the past 8 weeks, were there moments when you did not work out, even though you had planned to do so?” (yes/no)
  - If ‘yes’: “What did you do instead? Please name a maximum of three activities in which you engaged most often.” (empty lines) “Please rate the activities on the following dimensions”:
    - “How **important** was this activity?” (1 = not at all, 7 = very much)
    - “How **pleasant** was this activity?” (1 = not at all, 7 = very much)
    - “How much did/does this activity in general **facilitate** your workout?” (1 = not at all, 7 = very much)
    - “How much did/does this activity in general **prevent** you from exercising? (1 = not at all, 7 = very much)
- “During the past 8 weeks, were there moments when you worked out, even though you had planned to do different things?” (yes/no)
  - If ‘yes’: “What did you put off when you worked out instead? Please name a maximum of three activities you put off most often.” (empty lines)
    - “How **important** was this activity?” (1 = not at all, 7 = very much)
    - “How **pleasant** was this activity?” (1 = not at all, 7 = very much)
    - “How much did the workout in general **facilitate** this activity?” (1 = not at all, 7 = very much)
    - “How much did the workout in general **prevent** you from engaging in this activity? (1 = not at all, 7 = very much)
- “How much do you **generally** live by the following mottos?”:
    - “The way is the goal” (1 = not at all, 7 = very much)
    - “No matter how, as long as I reach the goal” (1 = not at all, 7 = very much)

Appendix B: Measures and Items Used in Bachelor's Thesis Study

All items were administered in German; translations into English by the author.

Baseline questionnaire

- Informed consent
- First name / surname
- Email address
- Phone number
- Sex (male, female)
- Date of birth
- Civil status (single, married/partnership, widowed, divorced/after break up)
- Highest grade (compulsory education/lower secondary education, upper secondary level education [vocational education, baccalaureate school, or upper secondary specialized schools], university degree, other degrees).
- Physical health ("All in all, how do you rate your physical health?"; 1 = very bad; very good)
- Life satisfaction ("All in all, how satisfied are you with your life?"; 1 = not at all; 7 very much)
- "What do you study?" (major/minor[s])
- "How many ECTS points do you plan to achieve in this semester?"
- "In what semester are you?"
- "Do you currently work?" (yes [percentages?], no)
- "When did you start with your bachelor's thesis (date)?"
- "When do you intend to submit your bachelor's thesis (date)?"
- "When is the deadline for your bachelor's thesis (date)?"
- "How long should your bachelor's thesis be (number of pages)?"
- "How many ECTS points do you receive when you pass your bachelor's thesis?"
- "What grade do you want to achieve for your bachelor's thesis?"
- Questions regarding the writing:
  - "How **important** is it for you to achieve this grade?" (1 = not at all; 7 = very much)
  - "How **likely** is it that you will achieve this grade?" (1 = not at all; 7 = very much)
  - "How **important** is it for you **in general** to do well in your studies?" (1 = not at all; 7 = very much)
  - "How **useful** is this bachelor's thesis to do well in your studies?" (1 = not at all; 7 = very much)
  - "How **pleasant** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)
  - "How **pleasant** is the writing of written reports in general?" (1 = not at all; 7 = very much)
  - "How **important** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)

    - "How **important** is the writing of written reports **in general**?" (1 = not at all; 7 = very much)
    - "How **difficult** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **stressful** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **motivated** are you to write your bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **urgent** is it that you write your bachelor's thesis?" (1 = not at all; 7 = very much)
    - "Do you feel guilty when you do **not** write your bachelor's thesis?" (1 = not at all; 7 = very much)
    - "Do you feel guilty **when** you write your bachelor's thesis (because you should do other things)?" (1 = not at all; 7 = very much)
    - "How much do you think about **what** you need to do in order to complete your bachelor's thesis successfully?" (1 = not at all; 7 = very much)
    - "How much do you think about **why** you want to complete your bachelor's thesis successfully?" (1 = not at all; 7 = very much)
    - "When writing the bachelor's thesis, my motto is '**The way is the goal**.'" (1 = not at all; 7 = very much)
    - "When writing the bachelor's thesis, my motto is '**No matter how, as long as I reach the goal**.'" (1 = not at all; 7 = very much)
    - "Is the writing of the bachelor's thesis immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
- "What personal **goal** do you pursue with the bachelor's thesis (e.g., learn something new, getting ahead with my studies, impress others with a high grade)?" (open question)
    - "How **important** is it for you to achieve this goal?" (1 = not at all; 7 = very much)
    - "How **likely** is it that you will achieve this goal?" (1 = not at all; 7 = very much)
    - Control question: "For technical reasons, please select a three here." (1 = not at all; 7 = very much)
    - "How **pleasant** would the achievement of this goal be?" (1 = not at all; 7 = very much)
- "Is this **your first time** writing a bachelor's thesis?" (yes/no)
- Mood: "good-bad mood" subscale (all items 1 = not at all; 7 = very much) from the German version of the Multidimensional Mood State Questionnaire (MDBF; Steyer et al., 1997)
- "When you think about your bachelor's thesis: Which of the following statements do you think about most? Please allocate a total of 100 points the following statements.":
    - "Creating a schedule." (Process focus)
    - "The good feeling of having submitted the work." (Outcome focus)
    - "Ensure a clean and logical structure." (Process focus)

  - "Not having to revise or rewrite the thesis." (Outcome focus)
  - "Search for quotes and references and incorporate them into the work." (Process focus)
  - "Complete the module and get the ECTS points." (Outcome focus)
  - "Work regularly on the bachelor's thesis." (Process focus)
  - "Being satisfied with one's own performance." (Outcome focus)
  - "Check grammar, spelling and style." (Process focus)
  - "Get closer to graduation by passing the thesis." (Outcome focus)
- Evaluation of different (groups of) activities on the following dimensions: **pleasantness** (i.e., "How pleasant is this activity for you?"; 1 = very unpleasant, 7 = very pleasant), **importance** (i.e., "How important is this activity for you in general?"; 1 = very unimportant, 7 = very important), **procrastination** (i.e., "How often do you engage in this activity when procrastinating on writing written reports?"; 1 = never, 7 = very often), **facilitation** (i.e." How much does this activity facilitate the writing of your bachelor's thesis in general?"; 1 = not at all, 7 = very much), **conflict** (i.e., How much does the activity conflict with the writing of your bachelor's thesis in general?"; 1 = not at all, 7 = very much):
  - Chores
  - Neaten
  - Make lists
  - Administrative tasks
  - Relax/sleep
  - Multimedia
  - Eat/cook
  - Meet friends/family
  - (Online-)Shopping
  - Social media / phone
  - Read
  - Surf the internet (without social media)
  - Daydream / play with pets
  - Stroll, sports
  - Ruminate
  - Participate in studies
  - Work
  - Job Hunt
  - Slack
  - Help others
  - Smoke
  - Study
  - "Can you think of any other activities that you pursue in your everyday life that have not yet been mentioned? Please write each of them on a separate line and rate them as well."
- "How much do you generally live by the following mottos?":
  - "The way is the goal" (1 = not at all, 7 = very much)
  - "No matter how, as long as I reach the goal" (1 = not at all, 7 = very much)

- "How far away is the deadline for the bachelor's thesis for you at the moment?" (Slider from 0 = very far away to 100 = very close)
- Trait procrastination: Pure Procrastination Scale (Krause & Freund, 2014a; Steel, 2010) including the same control question as above.
- Adapted version ("writing the thesis" instead of "studying") of the Academic Procrastination State Inventory (Schouwenburg, 1995; German translation by Helmke & Schrader, 2000) including the same control question as above.
- "How likely is it that you will write your thesis on any day of the week? Please allocate a total of 100 points to one or multiple days. For example, if you plan to write your thesis only on Thursdays, allocate all 100 points to "Thursday". If you will equally likely write your thesis on Mondays and Saturdays, allocate 50 point to each of the two weekdays."
- "Please now indicate a time window in which you plan to write your thesis on your 'writing day'. If you have more than one 'writing day', please select the day on which you plan to work longest on your thesis." (dropdown menu)

Thesis/procrastination questionnaire

- "Were you writing your thesis when you received this questionnaire?" (yes/no)
- "Did you just do what you were **supposed to do**?" (yes / no, I should be doing something else, namely…)
- "Did you just do what you **wanted to do**? (yes / no, I'd just rather do something else, namely…)
- "Have you already submitted your thesis?" (no, I'm planning to submit on (date) ___ / yes, on (date) ___)
  - If first question of questionnaire was answered with 'yes': "You indicated that you were writing **your bachelor's thesis** when you received the questionnaire. Please answer the following questions regarding this activity":
    - "How **pleasant** is this activity?" (1 = not at all; 7 = very much)
    - "How **important** is this activity?" (1 = not at all; 7 = very much)
    - "How **difficult** is this activity?" (1 = not at all; 7 = very much)
    - "How **stressful** is this activity?" (1 = not at all; 7 = very much)
    - "How **motivated** are you to engage in this activity?" (1 = not at all; 7 = very much)
    - "Do you feel guilty **while engaging** in this activity?" (1 = not at all; 7 = very much)
    - "Would you feel guilty if you **did not** engage in this activity?" (1 = not at all; 7 = very much)
    - "How **urgent** is it to engage in this activity?" (1 = not at all; 7 = very much)
    - Outcome focus: "To what extent are you focusing on what you want to **achieve** with this activity?" (1 = not at all; 7 = very much)
    - Process focus: "To what extent are you focusing **on the activity itself**?" (1 = not at all; 7 = very much)
    - "When writing the bachelor's thesis, my motto is **'The way is the goal.'**" (1 = not at all; 7 = very much)
    - "When writing the bachelor's thesis, my motto is **'No matter how, as long as I reach the goal.'**" (1 = not at all; 7 = very much)

    - "Is this activity immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
- If first question of questionnaire was answered with 'no': "You indicated that you were not writing your bachelor's thesis when you received the questionnaire. What did you do?" (open question) "Please answer the following questions regarding **this activity**":
    - "How **pleasant** is this activity?" (1 = not at all; 7 = very much)
    - "How **important** is this activity?" (1 = not at all; 7 = very much)
    - "How **difficult** is this activity?" (1 = not at all; 7 = very much)
    - "How **stressful** is this activity?" (1 = not at all; 7 = very much)
    - "How **motivated** are you to engage in this activity?" (1 = not at all; 7 = very much)
    - "Do you feel guilty **while engaging** in this activity?" (1 = not at all; 7 = very much)
    - "Would you feel guilty if you **did not** engage in this activity?" (1 = not at all; 7 = very much)
    - "How **urgent** is it to engage in this activity?" (1 = not at all; 7 = very much)
    - "How much does this activity **facilitate** the writing of your bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How much does this activity **conflict** with writing of your bachelor's thesis?" (1 = not at all; 7 = very much)
    - Outcome focus: "To what extent are you focusing on what you want to **achieve** with this activity?" (1 = not at all; 7 = very much)
    - Process focus: "To what extent are you focusing on the **activity itself**?" (1 = not at all; 7 = very much)
    - "When engaged in this activity, my motto is '**The way is the goal.'**" (1 = not at all; 7 = very much)
    - "When engaged in this activity, my motto is **'No matter how, as long as I reach the goal.'**" (1 = not at all; 7 = very much)
    - "Is this activity immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
    - "Please also answer the following questions regarding the **writing of the thesis**:"
    - "How **pleasant** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **important** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **difficult** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **stressful** is the writing of the bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **motivated** are you to write the bachelor's thesis?" (1 = not at all; 7 = very much)

        - "Do you feel guilty **when you write** the bachelor's thesis (because you should do other things)?" (1 = not at all; 7 = very much)
        - "Do you feel guilty **when you do not write** your bachelor's thesis?" (1 = not at all; 7 = very much)
        - "How **urgent** is it that you write the bachelor's thesis?" (1 = not at all; 7 = very much)
        - Outcome focus: "To what extent do you focus on what you want to **achieve** with writing the bachelor's thesis?" (1 = not at all; 7 = very much)
        - Process focus: "To what extent do you focus on the writing of the **bachelor's thesis itself**?" (1 = not at all; 7 = very much)
        - "When writing the bachelor's thesis, my motto is **'The way is the goal.'**" (1 = not at all; 7 = very much)
        - "When writing the bachelor's thesis, my motto is **'No matter how, as long as I reach the goal.'**" (1 = not at all; 7 = very much)
        - "Is writing the thesis immediately **rewarding** or will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
    - Mood: "good-bad mood" subscale (all items 1 = not at all; 7 = very much) from the German version of the Multidimensional Mood State Questionnaire (MDBF; Steyer et al., 1997)
    - "How far away is the deadline for the bachelor's thesis for you at the moment?" (Slider from 0 = very far away to 100 = very close)
    - "How confident are you that you will achieve a pass for your bachelor's thesis?" (Slider from 0 = not at all confident to 100 = very confident)
    - Questions regarding the past week:
        - "Did you make as much progress as you wanted to in the past week?" (Slider from 0 = not at all confident to 100 = very confident)
        - "How many hours did you invest in your bachelor's thesis in the past week?" (__ hours)
        - "Is this time approximately what you had planned to invest? Please do not use the slider if you had not any specific amount of hours in mind." (Slider 0 = less than planned to 100 = more than planned)
        - "How satisfied are you overall with the past week regarding the writing of your bachelor's thesis?" (1 = not at all, 7 = very much)
        - "Were there moments when you did not write your bachelor's thesis, even though you had planned to do so?" (yes/no)
            - If 'yes': "What did you do instead? Please name a maximum of three activities in which you engaged most often." (empty lines) "Please rate the activities on the following dimensions":
                - "How **often** did you engage in this activity?" (1 = very rarely, 7 = very often)
                - "How **important** is this activity?" (1 = not at all, 7 = very much)
                - "How **pleasant** is this activity?" (1 = not at all, 7 = very much)
        - "Were there moments when you wrote your bachelor's thesis, even though you had planned to do something else?" (yes/no)
        - "What do you intend to do after completing the questionnaire?"

- If first question of questionnaire was answered with ‘yes’: 1 = Keep working on my bachelor’s thesis for about __ minutes, 2 = something else, namely ____
- If first question of questionnaire was answered with ‘no’: 1 = Keep doing what I was doing before I received the questionnaire for about __ minutes, 2 = write my bachelor’s thesis, 3 = something else, namely ___.

Final questionnaire

- “When did you submit your bachelor’s thesis? (date)”
- “Has your bachelor’s thesis already been graded?” (I passed with grade___, I did not pass with grade___, thesis has not been graded yet).
- “The worst grade in my country is ___”, “The best grade in my country is ___”
- Mood: “good-bad mood” subscale (all items 1 = not at all; 7 = very much) from the German version of the Multidimensional Mood State Questionnaire (MDBF; Steyer et al., 1997)
- Evaluation of writing process:
  - “Did you correctly estimate the **amount of effort required** for the bachelor's thesis?” (Slider from 0 = I underestimated it to 100 = I overestimated it)
  - “Did you set yourself rather **intermediate goals** or did you focus **on the big end goal**? (Slider from 0 = small goals to 100 = big goals)
  - “Were you more productive **the closer** or **farther away** the deadline for your thesis was?” (Slider from 0 = far away from the deadline to 100 = close to the deadline)
  - “Was it harder **to start writing** or to **stay tuned** once you started?” (Slider from 0 = beginning was harder to 100 = staying tuned was harder)
- “At times I did not write the bachelor’s thesis although I had planned to do so…
  - …I constantly had to think about the bachelor’s thesis” (1 = not at all; 7 = very much)
  - …I was motivated to do things I wouldn’t have done otherwise” (1 = not at all; 7 = very much)
  - …I engaged in **unpleasant** (0) vs. **pleasant** activities (100) instead” (Slider)
  - …I engaged in **unimportant** (0) vs. **important** activities (100) instead” (Slider)
  - …I engaged in **non-urgent** (0) vs. **urgent** activities (100) instead” (Slider)
- Evaluation of writing process:
  - “How **satisfied** are you overall regarding the writing of your bachelor’s thesis?” (1 = not at all; 7 = very much)
  - “How **pleasant** was the writing of your bachelor’s thesis?” (1 = not at all; 7 = very much)
  - “How **important** was the writing of your bachelor’s thesis?” (1 = not at all; 7 = very much)
  - “How **difficult** was the writing of your bachelor’s thesis?” (1 = not at all; 7 = very much)
  - “How **stressful** was the writing of your bachelor’s thesis?” (1 = not at all; 7 = very much)
  - “How **motivated** were you to write your bachelor’s thesis?” (1 = not at all; 7 = very much)

    - "Did you feel guilty when you **wrote** your bachelor's thesis?" (1 = not at all; 7 = very much)
    - "Did you feel guilty when you **did not write** your bachelor's thesis?" (1 = not at all; 7 = very much)
    - "How **urgent** was it to write your bachelor's thesis?" (1 = not at all; 7 = very much)
    - Outcome focus: "To what extent did you focus on what you want to **achieve** with your bachelor's thesis?" (1 = not at all; 7 = very much)
    - Process focus: "To what extent did you focus on the writing of your **bachelor's thesis itself**?" (1 = not at all; 7 = very much)
    - "When writing the bachelor's thesis, my motto was **'The way is the goal.'**" (1 = not at all; 7 = very much)
    - "When writing the bachelor's thesis, my motto was **'No matter how, as long as I reach the goal.'**" (1 = not at all; 7 = very much)
    - "Did you experience the writing of your bachelor's thesis as immediately **rewarding** or did/will it pay off later in time (in hours, weeks, days, or months)?" (1 = immediately rewarding; 7 = rewarding later in time)
- "Independent of the requirements, I would have been more involved with certain aspects of my bachelor's thesis if I had had enough time." (1 = not at all; 7 = very much)
- "I would have worked less on my bachelor's thesis without external pressure." (1 = not at all; 7 = very much)
- "I put myself under pressure regarding writing of my bachelor's thesis." (1 = not at all; 7 = very much)
- "I complied with the writing windows I had planned." (1 = not at all; 7 = very much)
- "I struggled to give the writing a permanent place in my everyday life." (1 = not at all; 7 = very much)
- "I often had disturbing thoughts when writing." (1 = not at all; 7 = very much)
- "I often did not notice how time flies when writing." (1 = not at all; 7 = very much)
- "I had been looking forward to writing my bachelor's thesis again after longer breaks." (1 = not at all; 7 = very much)
- "At the beginning of the study, you had specified a personal goal that you wanted to pursue with writing the bachelor's thesis, namely …. Did you achieve this goal or not?" (yes; no, but I can still achieve it; no, and I cannot achieve it anymore)
    - If 'yes':
        - "How important was the achievement of this goal?" (1 = not at all; 7 = very much)
        - "How pleasant is the achievement of this goal?" (1 = not at all; 7 = very much)
    - If 'no, but I can still achieve it':
        - "How important is the achievement of this goal?" (1 = not at all; 7 = very much)
        - "How likely is it that you will still achieve this goal? (1 = not at all; 7 = very much)

        - "How pleasant would the achievement of this goal be?" (1 = not at all; 7 = very much)
    - If 'no, and I cannot achieve it anymore':
        - "How important was the achievement of this goal for you?" (1 = not at all; 7 = very much)
        - "How pleasant would it have been if you had achieved this goal?" (1 = not at all; 7 = very much)
- State Procrastination: Adapted version (replacing "studying" with "writing the bachelor's thesis") of the Academic Procrastination State Inventory (Schouwenburg, 1995; German translation by Helmke & Schrader, 2000) including the same control question as above.
- "Were there moments when you did not write your bachelor's thesis, even though you had planned to do so?" (yes/no)
    - If 'yes': "What did you do instead? Please name a maximum of three activities in which you engaged most often." (empty lines) "Please rate the activities on the following dimensions":
        - "How **often** did you engage in this activity?" (1 = very rarely, 7 = very often)
        - "How **important** was this activity?" (1 = not at all, 7 = very much)
        - "How **pleasant** was this activity?" (1 = not at all, 7 = very much)
        - "How much did/does this activity in general **facilitate** the writing of your bachelor's thesis?" (1 = not at all, 7 = very much)
        - "How much did/does this activity in general **prevent** you from writing your bachelor's thesis? (1 = not at all, 7 = very much)
- "Were there moments when you wrote your bachelor's thesis, even though you had planned to do different things?" (yes/no)
    - If 'yes': "What did you put off when you wrote your bachelor's thesis instead? Please name a maximum of three activities you put off most often." (empty lines)
        - "How **often** did you put off this activity?" (1 = very rarely, 7 = very often)
        - "How **important** was this activity?" (1 = not at all, 7 = very much)
        - "How **pleasant** was this activity?" (1 = not at all, 7 = very much)
        - "How much did the writing of your bachelor's thesis in general **facilitate** this activity?" (1 = not at all, 7 = very much)
        - "How much did the writing of your bachelor's thesis in general **prevent** you from engaging in this activity? (1 = not at all, 7 = very much)
- "How much do you **generally** live by the following mottos?":
    - "The way is the goal" (1 = not at all, 7 = very much)
    - "No matter how, as long as I reach the goal" (1 = not at all, 7 = very much)

CURRICULUM VITAE

Name	Oliver J. Kaftan
Date of birth	April 29, 1985
Place of birth	Zurich, Switzerland
Citizenship	Swiss

Education and Honors

2014-2016	«Teaching Skills» Certificate for Higher Education, University of Zurich/ETH, Zürich
Since 2014	Fellow of the International Max Planck Research School «The Life Course: Evolutionary and Ontogenetic Dynamics» (participating institutions: MPI for Human Development, Humboldt-Universität zu Berlin, Freie Universität Berlin, University of Michigan, University of Virginia, University of Zurich)
Since 2014	PhD student at the Department of Psychology, Chair of Developmental Psychology: Adulthood (Chairholder: Prof. Dr. phil. Alexandra M. Freund), University of Zurich, Zurich
2011-2013	Master of Science in Psychology (major) and Philosophy (minor), University of Zurich, Zurich Area of specialization: Clinical and Health Psychology
2011	Semesterpreis der Universität Zürich [University of Zurich award for outstanding term paper]. Awarded for the paper «Konzepte von Gesundheit und Krankheit: Unzulänglichkeiten und normative Implikationen» [Concepts of health and illness: Shortcomings and normative implications], nomination proposed by Dr. med. Josef Guggenheim and PD Dr. phil. Peter Schneider
2007-2011	Bachelor of Science in Psychology (major), Philosophy (minor) and Sociology (minor), University of Zurich, Zurich
2007	Award for scoring the best A Level results in Switzerland
2003-2007	Eidgenössische Matura [Swiss A Levels], AKAD College, Zurich Areas of specialization: Philosophy, Psychology und Pedagogy
2000-2003	Commercial and Informatics School, Juventus School and Bénédict School, Zurich Diplomas: Bürofachdiplom VSH [Diploma in Office Administration], Handelsdiplom VSH [Swiss Federal Diploma in Business Management], Informatik-Anwender SIZ [Swiss Certificate for IT Users], First Certificate in English (University of Cambridge), Diplôme d'Etudes en Langue Française (DELF) [Diploma in French Studies]

Internships and Professional Positions

2013	Research assistant, Department of Psychology, Chair of Motivation, Volition and Emotion (Chairholder: Prof. Dr. phil. Veronika Brandstätter), University of Zurich, Zurich
2012-2013	Editor und SEO Manager, Pro Juventute, Zurich
2012-2013	Research assistant, National Centre of Competence in Research (NCCR) «LIVES: Overcoming Vulnerability: Life Course Perspectives», Subproject «Management of Multiple Roles Across Adulthood» (Project board: Prof. Dr. phil. Alexandra M. Freund, Prof. Dr. phil. Bettina S. Wiese, Dr. sc. ETH Michaela Knecht), Department of Psychology, Chair of Applied Psychology: Life-Management (Chairholder: Prof. Dr. phil. Alexandra M. Freund), University of Zurich, Zurich
2012	Intern (2.5 months), Acute Day Hospital, Psychiatric University Hospital of Zurich, Zurich (Supervisors: PD Dr. med. Karsten Heekeren and lic. phil. Sabrina Sanfilippo)
2011-2012	Research assistant for Dr. phil. Jan-Christoph Heilinger, Centre for Ethics, Institute of Biomedical Ethics, University of Zurich, Zurich
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2011	Research intern (3 months), Department of Psychology, Chair of Applied Psychology: Life-Management (Chairholder: Prof. Dr. phil. Alexandra M. Freund), University of Zurich, Zurich (Supervisors: Dr. phil. Marie Hennecke and Prof. Dr. phil. Alexandra M. Freund)
2010-2011	Copywriter, dotpulse Webagentur AG, Zurich
2008-2011	Editor, Students.ch and 20min.ch, Zurich
2004-2005	Intern (12 months), Special Education School, Affoltern am Albis